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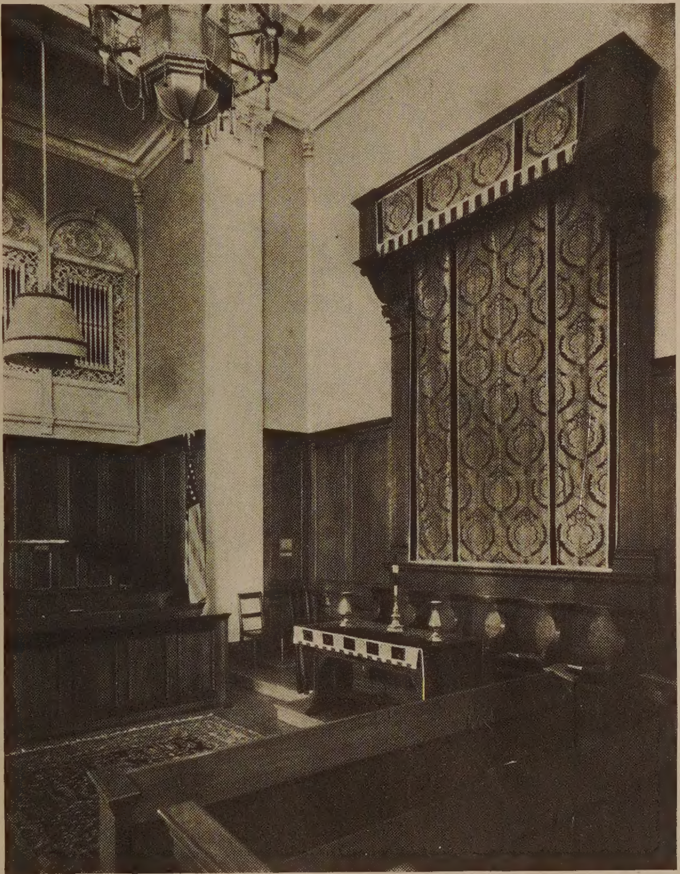
The First Presbyterian Church, Utica, N. Y.

Cram & Ferguson, Architects; Rushmer & Jennison, Associate Architects

TOO much freedom is said to be bad for any one; most architects would probably agree that it is not so much damaging as merely dull. The imagination of a real designer would be little stirred by the usual building site of the Beaux Arts projet—"sufficiently vast and sensibly level," and the Vitruvian Pegasus really flies more comfortably when he starts from a solid take-off of stimulating restrictions whether of site, cost, material, or programme.

The problem of the First Presbyterian Church at Utica is an interesting example of a modern project where, perhaps, more than the usual number of limiting conditions were present. The site is on Genesee Street, one of the main thoroughfares of the city, and occupies the entire frontage between two side streets. At the back is a party line. With the land, the church acquired two buildings: one a very large house which stood on the northerly end of the lot, and a stable which lay to the south of this house and at the very back of the lot. The house was to be preserved for Sunday-school purposes; the stable was to be reconstructed as a gymnasium; therefore, the church had to be placed between the stable and the street, on the south side of the lot. This fixed the rear line of the church as the street side of the stable. On the front, a certain definite setback from Genesee Street fixed the available space in that direction. When the church abandoned their former building, they saved the old walnut pews and decided to use them again in their new edifice, and to use them in almost the same layout as formerly; the width of the building was absolutely determined by these pews.


Chancel

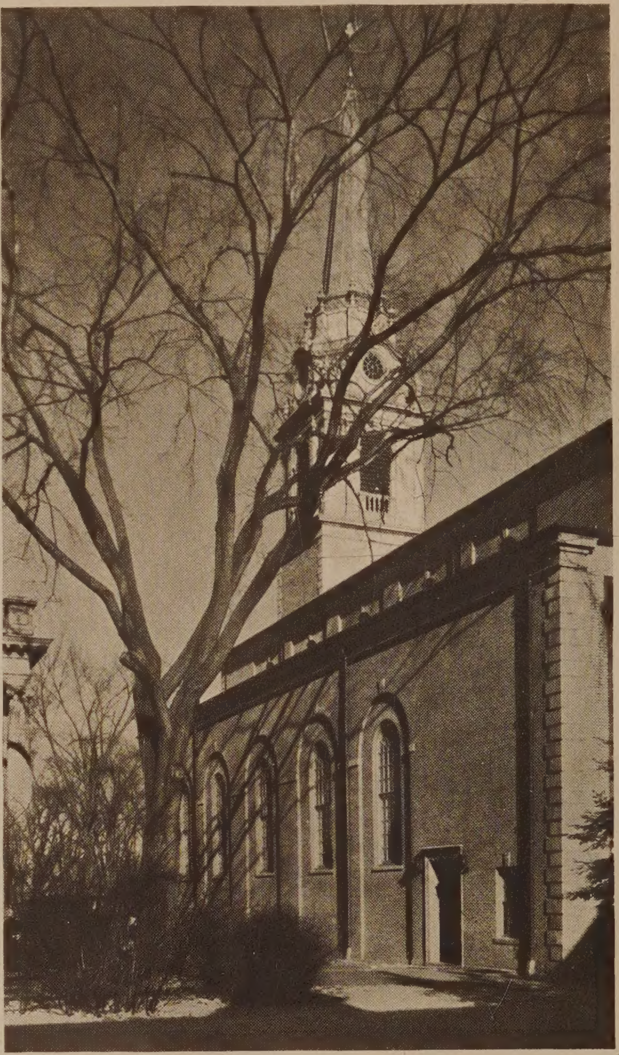
When the problem of the architectural style of the new church came up for consideration, it was obvious that the residence already existing on the lot was the determining factor. This house is in general built in a free classical style, of light brick, limestone, and terra-cotta. Monolithic stone columns, running the height of two stories, give the exterior an unusually large scale, which has to be considered in designing any building related to it. A proper relating of the two buildings really determined that the style of the church should be classical, and made it necessary that in scale and in mass the church should be large enough properly to dominate the group. Thus in advance were determined the limits of the church structure, as well as its scale, style, and general exterior color scheme.

English Renaissance, usually called "Georgian," is the particular phase of classical style employed in the church. It harmonizes well enough with the adjoining house, which could not be followed exactly as precedent in detail. On its own merits this sturdier version of our local "Colonial" architecture seems especially suitable for use in this part of the country. Moreover, it originated at a time almost contemporary with the Protestant Reformation, and has always been largely used in buildings for various Protestant bodies. Even on local grounds Utica has its own classical tradition in a number of interesting houses of Erie Canal times, as well as a really charming Episcopal church of the same era in the "Colonial Gothic" manner—a phase of our vernacular architecture which has been too much neglected, and one which may yet have a vogue in the hands of some daring designer.

In scheme the plan follows traditional lines. The tower is placed at the front toward Genesee Street, and is surrounded by a Corinthian colonnade. The lower part of the tower is used as a vestibule; this opens into an inner lobby which not only gives additional protection from exterior drafts and cold, but is large enough to serve as a place for friendly meeting and conversation before and after services. From this lobby double stairs lead to an ample gallery above it, and five doors give access to the auditorium. This is divided into nave and two side aisles by slender columns widely spaced; the width, as has been said, is that of the former edifice occupied by the society, determined by the walnut pews re-used in the new structure. This width between outside walls—65 feet—is so considerable that the chief architectural problem was the subordinating of the effect of this width and the creation of a space in the nave proper which should have the right relation of length to breadth.

Another difficulty in plan was caused by the lack of space to bring the tower down on its own foundations outside the front wall of the nave. To obtain the necessary setback from the street, the tower had to be pushed into the mass of the church, and supported on a steel frame; the steel columns, on the auditorium side, are cased in the Corinthian columns of the gallery front.

The pulpit and choir are provided for in a spacious chancel, after an arrangement which is becoming increasingly popular with many of the evangelical churches. At one side and to the front is the pulpit proper; balancing it is the lectern. Behind are seats for the choir, divided and placed lengthwise. The communion-table is in the centre at the back, with a row of clergy seats behind it against the wall. The organ is divided into three parts. The main portion is arranged in two chambers, one on each side of the chancel; the echo organ is located on the Genesee Street end of the church. All three portions of the organ are of course played from the same keyboard by means of electrical connection. Placed on each side of the chancel, at the chancel end of the church, are two vestibules, one on each side, with exterior entrances; near the entrance on the church-house side is a small room for the minister. Still farther back, on the ground floor, are choir-rooms and two committee or class-rooms. Above these, on the second floor, is a gymnasium with lockers and showers. In the basement is located the heating-plant, which serves both the church and the church-house.


Side, entrance to south.

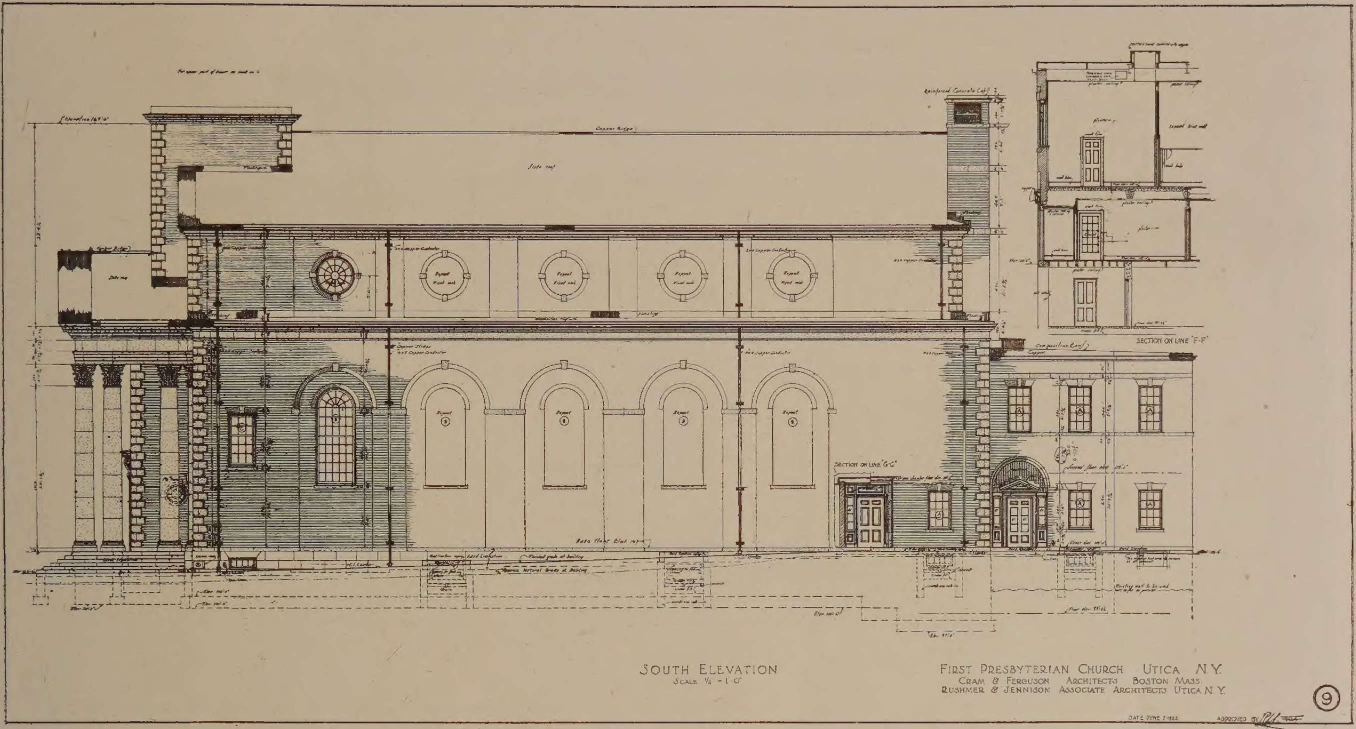
The central portion of the main body of the church is carried up into a clearstory, supported on the interior columns. This scheme has great advantages; it reduces the span to be roofed, gives an opportunity for interesting interior effects of light and shade. On the exterior the clearstory is no less useful. The cornice line of the side aisles is the same height as that of the church-house, but the church is made to dominate the house, as is proper, by the raised clearstory and high tower.

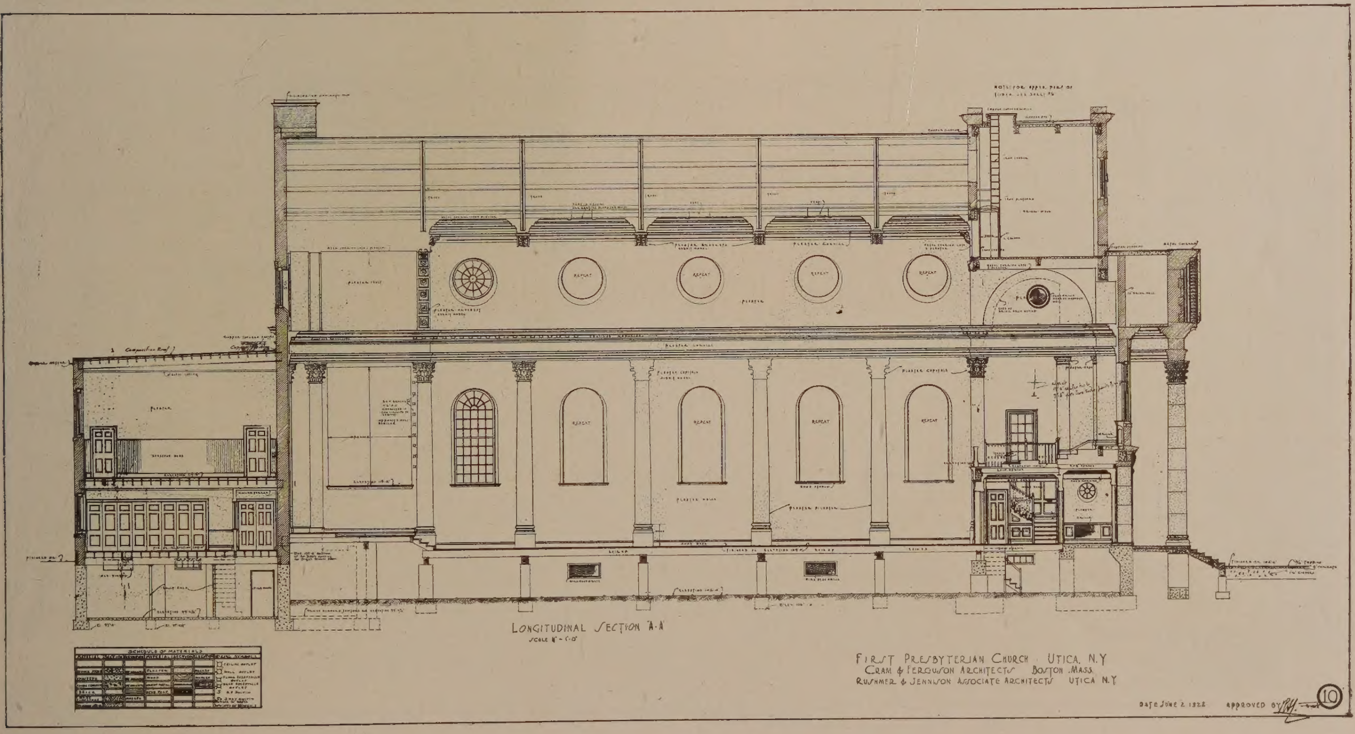
The exterior is built of light brick of several different shades laid up together to avoid monotony of color in the wall. The sills, cornices, and other exterior trim are of buff Bedford limestone. All the elaboration is concentrated at the front, where the tower, spire, and colonnade make a centre of interest; the remainder of the building is very simple, depending for its effect on the carefully studied relation of wall and window and door openings. The design of the spire recalls in a general way the spires of the Georgian churches of London; it is, however, not a copy of any of them. The tower is of masonry, while the spire is of metal.

The interior of the church also follows Georgian precedent. The vestibule, with its walls panelled in wood, its stairways and floor of black-and-white squares, is reminiscent of some of the New England mansions of the period just before the Revolution. Through glazed doors one passes to the auditorium. The walls, columns, and panelled ceiling are of plaster. The walls are tinted a soft gray color, and the trim a lighter shade. Pews and other natural wood finish are of walnut. The lower portion of the chancel walls are panelled in walnut, and the chancel furniture is of the same material. Back of the communion-table are five seats, and above these a hanging and canopy of tapestry panels divided by velvet bands and framed with walnut pilasters and cornice. The tapestry is of a fine pattern in blue and gold, and makes a spot of color which is the focus of the whole interior scheme. This blue color is carried into the cushions for the ministers' seats, the rug in the centre of the chancel, the cushions in the pews, the runners in the aisles, and the stems of the lighting-fixtures.

The lighting-fixtures themselves are in general simple. A generous gift, however, made it possible to provide for the centre of the chancel an unusual and effective lantern carried out in gilded bronze and favrile glass.

The interior volume of the church is large and the material of the walls not sound-absorbing. To avoid acoustic trouble on account of excessive reverberation, almost the entire ceiling is treated with correctional material. The result has been entirely satisfactory, and shows how completely modern methods can control the acoustical result.


SOUTH ELEVATION
Scale ¼ - 1' 0"
FIRST PRESBYTERIAN CHURCH UTICA N.Y.
CRAM & FERGUSON ARCHITECTS BOSTON MASS.
RUSHMER & JENNISON ASSOCIATE ARCHITECTS UTICA N.Y.
SECTION ON LINE "G-G"
SECTION ON LINE "F-F"
DATE JUNE 2 1922
APPROVED BY
9


LONGITUDINAL SECTION "A-A"
SCALE ⅛" - 1'-0"
FIRST PRESBYTERIAN CHURCH UTICA. N.Y
CRAM & FERGUSON ARCHITECTS BOSTON .MASS.
RUSHMER & JENNISON ASSOCIATE ARCHITECTS UTICA N.Y
DATE JUNE 2 1922
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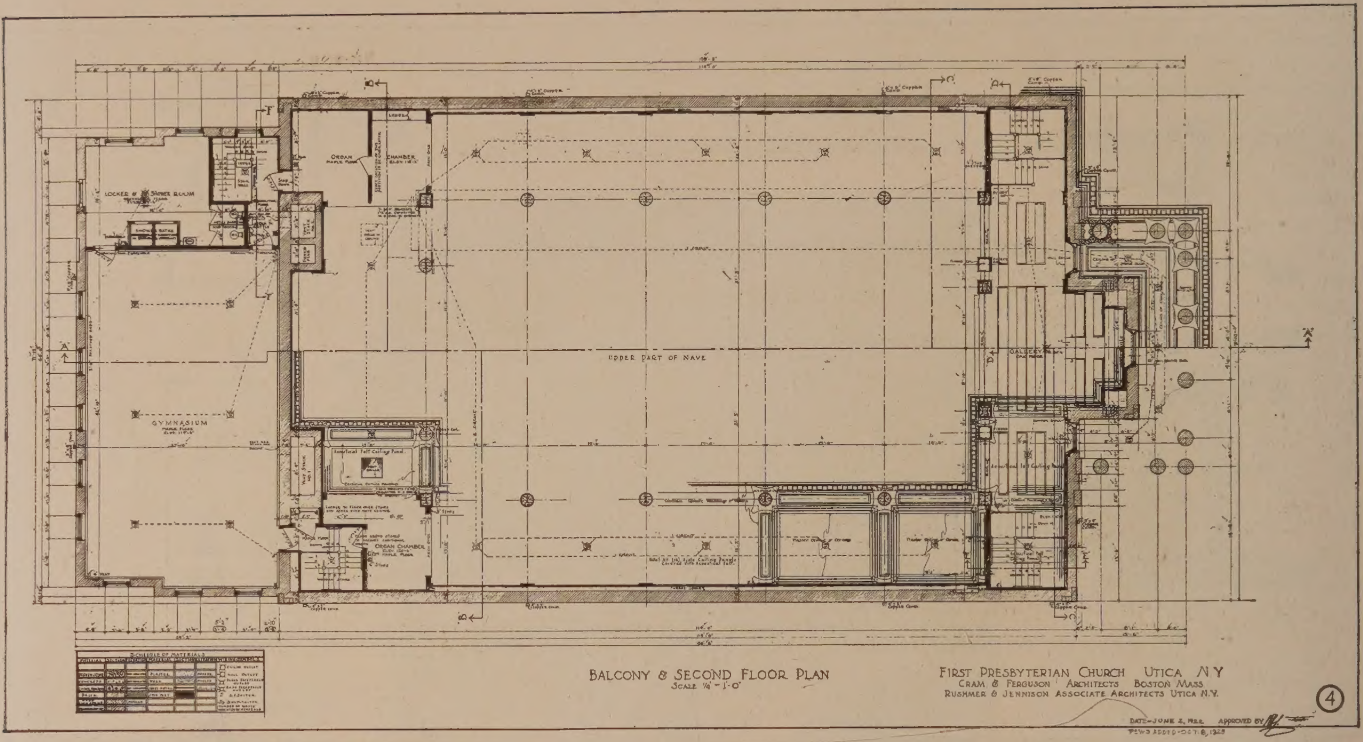
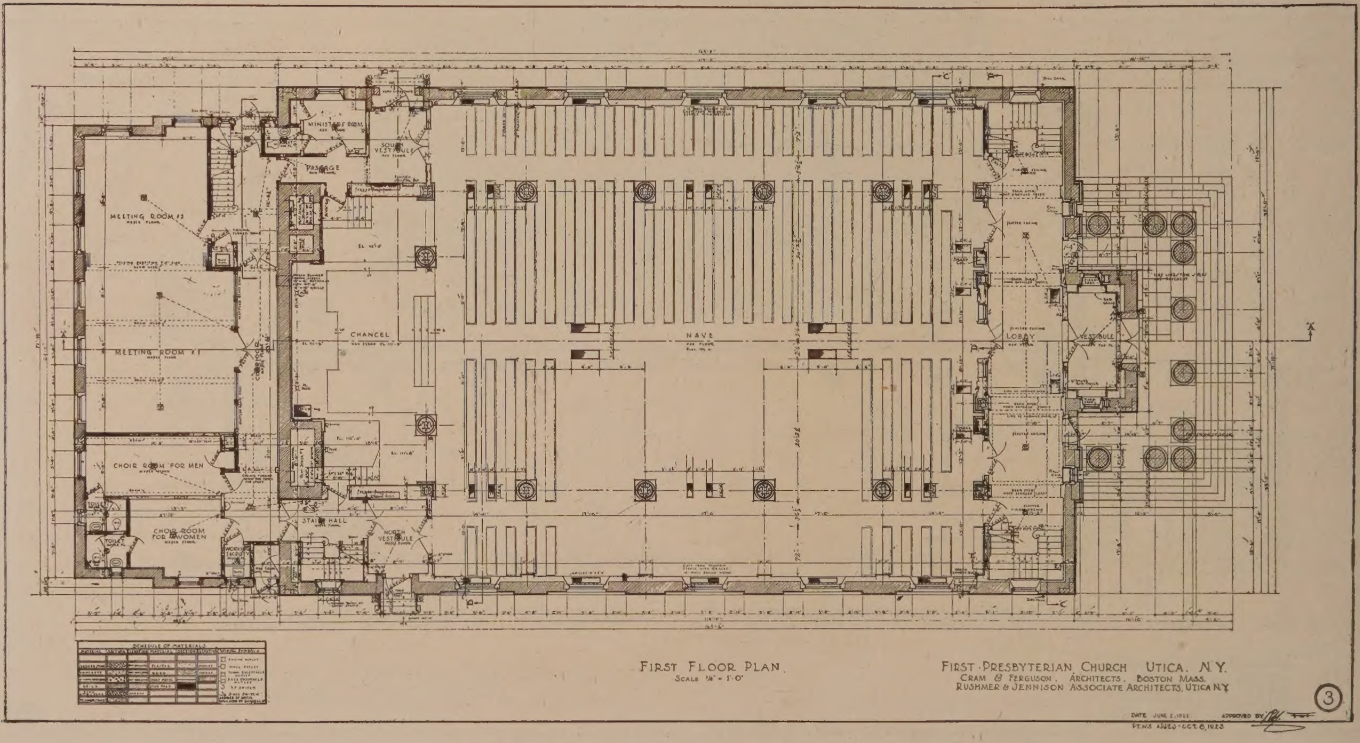


BALCONY & SECOND FLOOR PLAN
SCALE ¼" = 1'-0"

FIRST PRESBYTERIAN CHURCH UTICA N.Y.
CRAM & FERGUSON ARCHITECTS BOSTON MASS
RUSHMER & JENNISON ASSOCIATE ARCHITECTS UTICA N.Y.

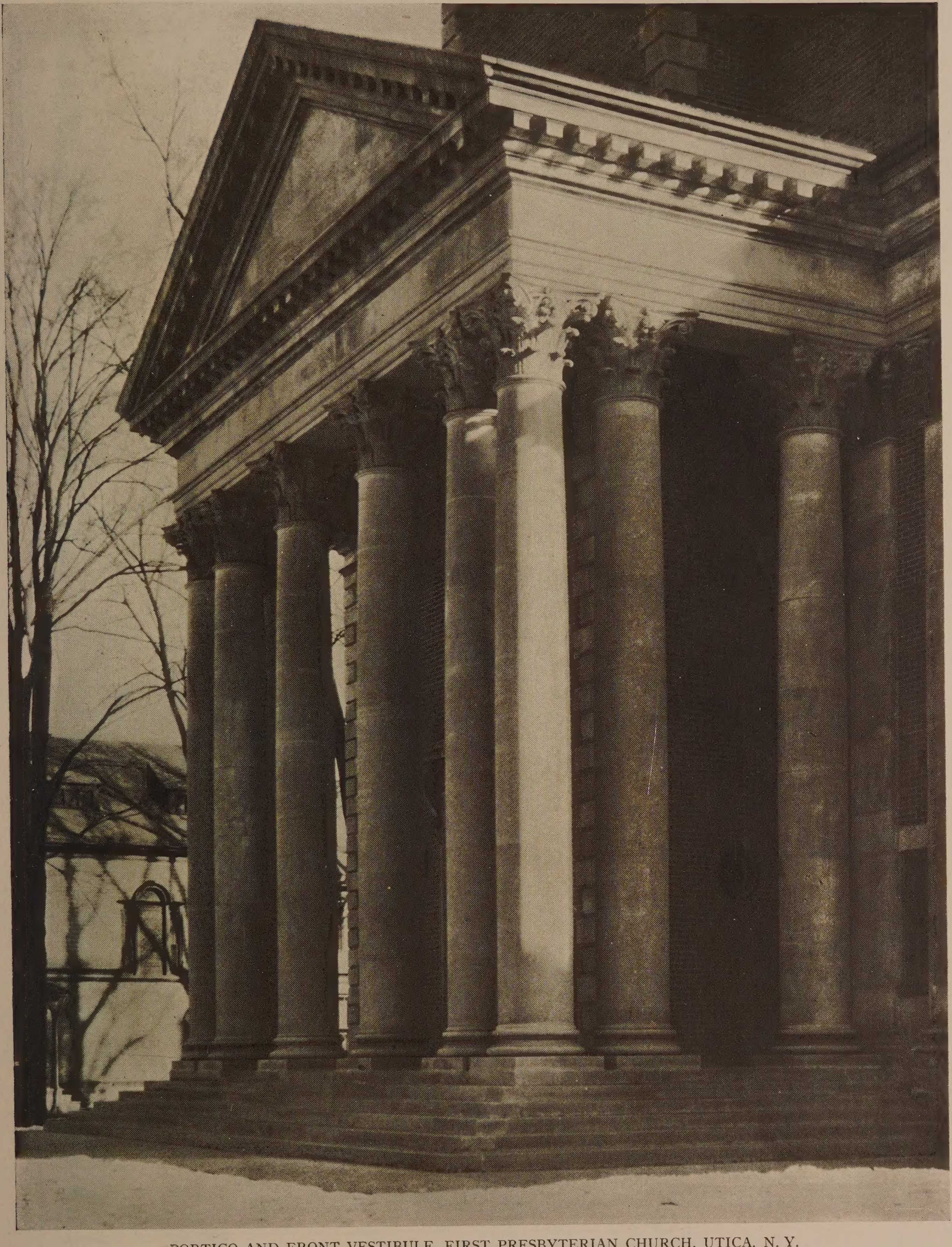
DATE—JUNE 2, 1922 APPROVED BY
PEWS ADDED—OCT. 8, 1923



FIRST FLOOR PLAN
SCALE ⅛" = 1'-0"

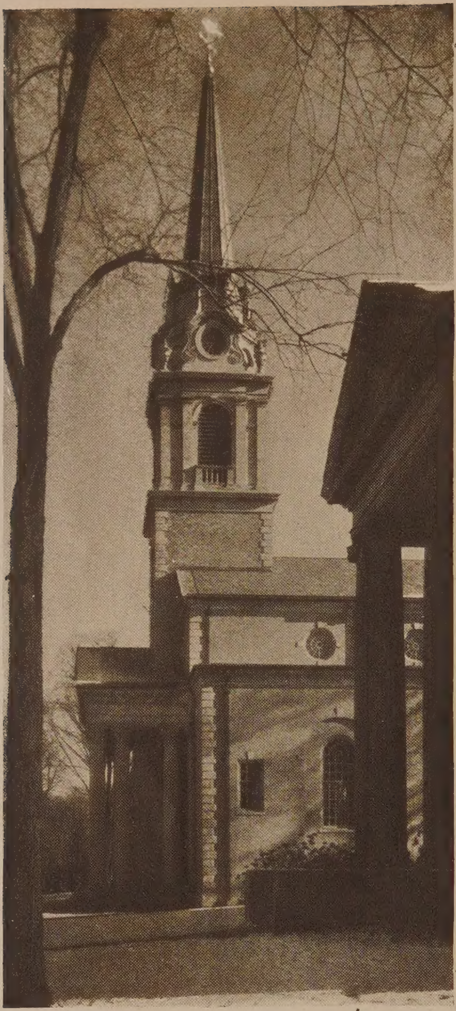
FIRST PRESBYTERIAN CHURCH UTICA. N.Y.
CRAM & FERGUSON. ARCHITECTS. BOSTON MASS.
RUSHMER & JENNISON ASSOCIATE ARCHITECTS, UTICA N.Y.

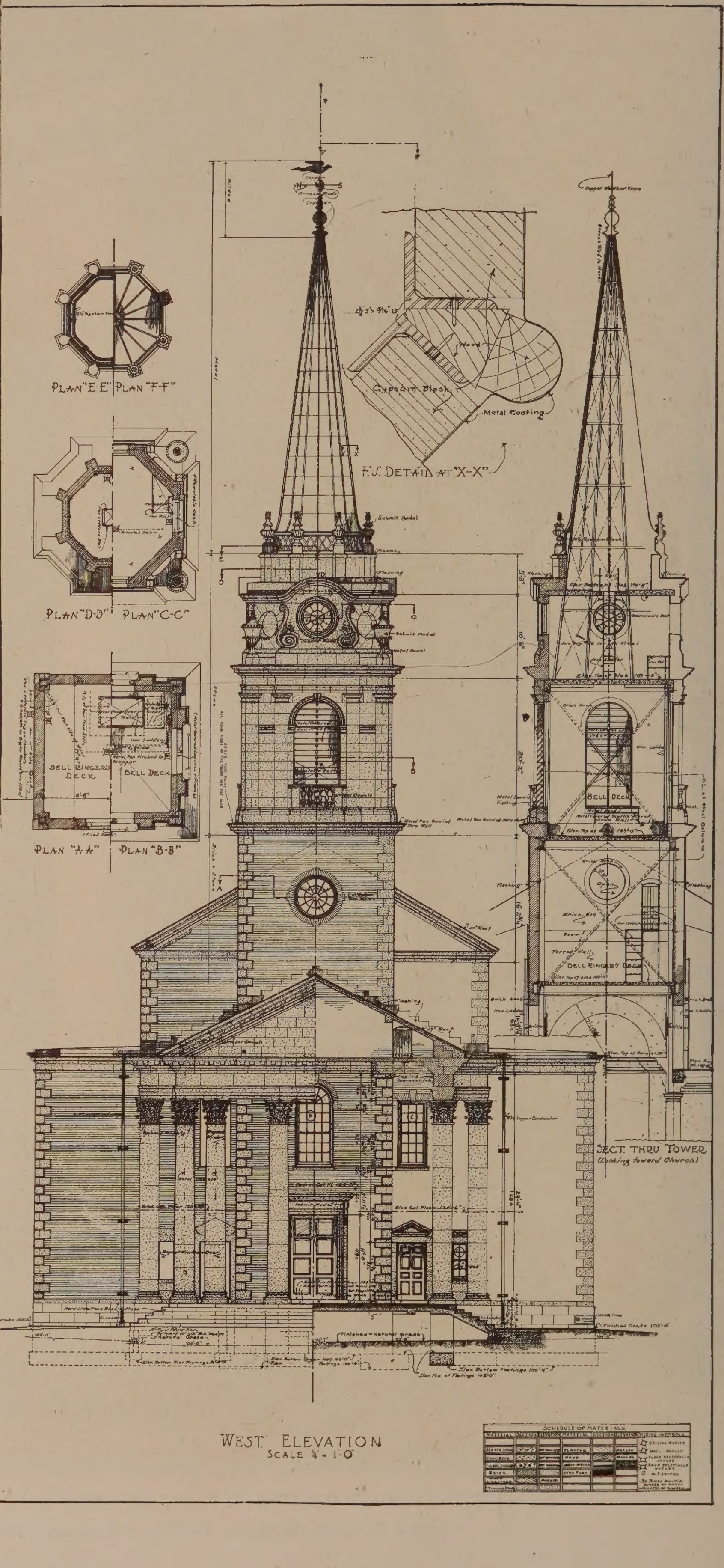
DATE JUNE 2, 1922 APPROVED BY
PEWS ADDED—OCT. 8, 1923



PORTICO AND FRONT VESTIBULE, FIRST PRESBYTERIAN CHURCH, UTICA, N. Y.

Cram & Ferguson, Architects; Rushmer & Jennison, Associate Architects.




PLAN "E-E"
PLAN "F-F"
PLAN "D-D"
PLAN "C-C"
PLAN "A-A"
PLAN "B-B"
BELL RINGER'S DECK
BELL DECK
Gypsum Block
Wood
Metal Roofing
F.S. DETAIL AT "X-X"
SECT. THRU TOWER
(Looking toward Church)
BELL DECK
BELL RINGER'S DECK
WEST ELEVATION
SCALE ¼" - 1'-0"
SCHEDULE OF MATERIALS
FIRST PRESBYTERIAN CHURCH UTICA N.Y
CRAM & FERGUSON ARCHITECTS BOSTON MASS
RUSHMER & JENNISON ASSOCIATE ARCHITECTS UTICA N.Y.
DATE-JUNE 2, 1922
APPROVED BY
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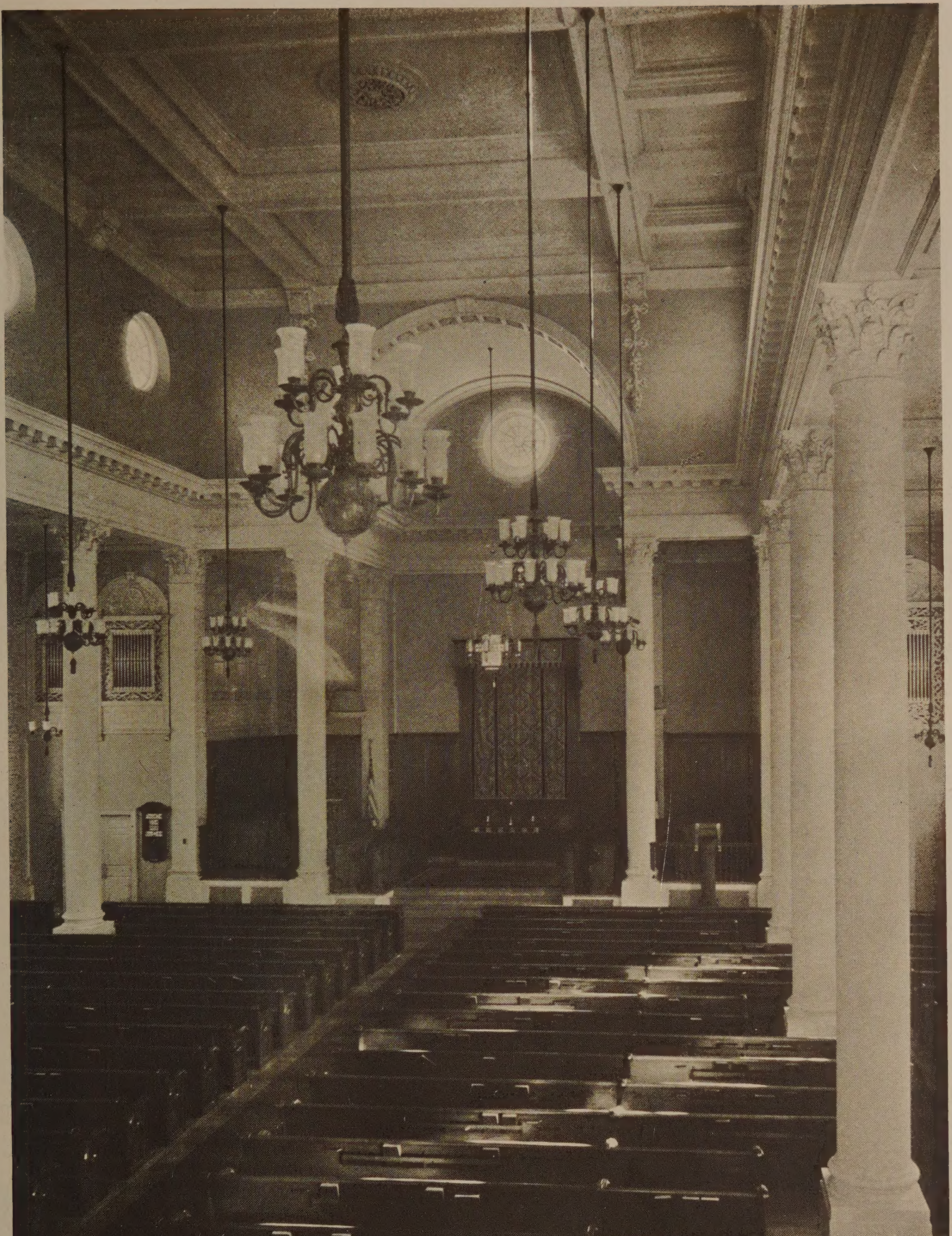
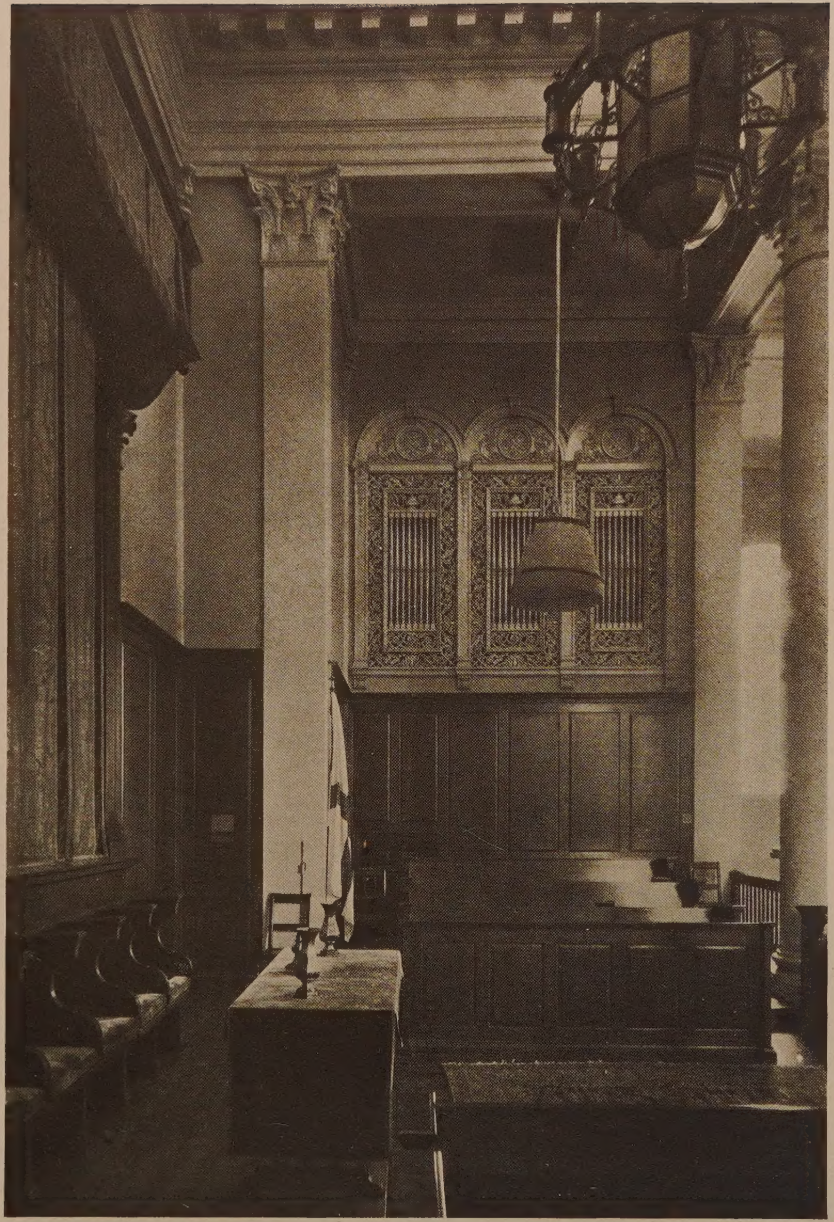
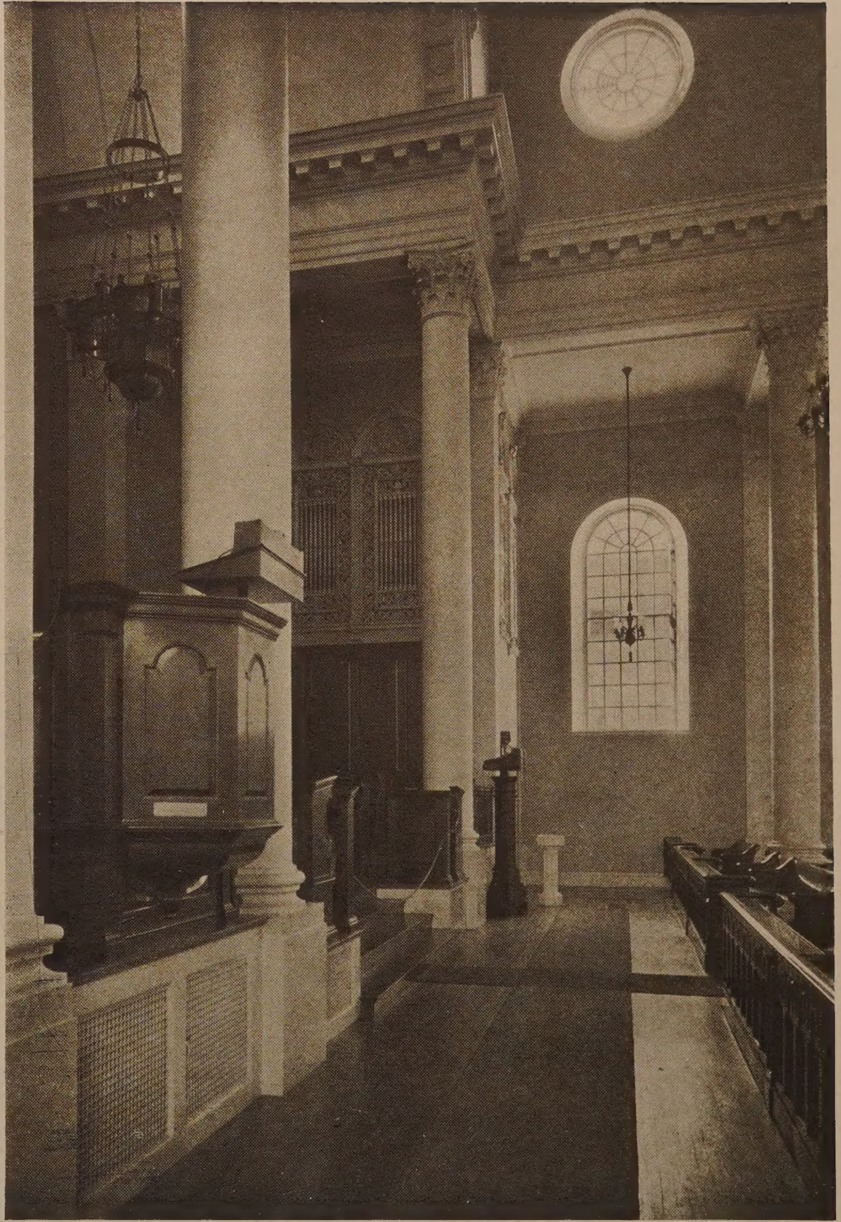


NAVE TOWARD CHANCEL, FIRST PRESBYTERIAN CHURCH, UTICA, N. Y.

Cram & Ferguson, Architects; Rushmer & Jennison, Associate Architects.

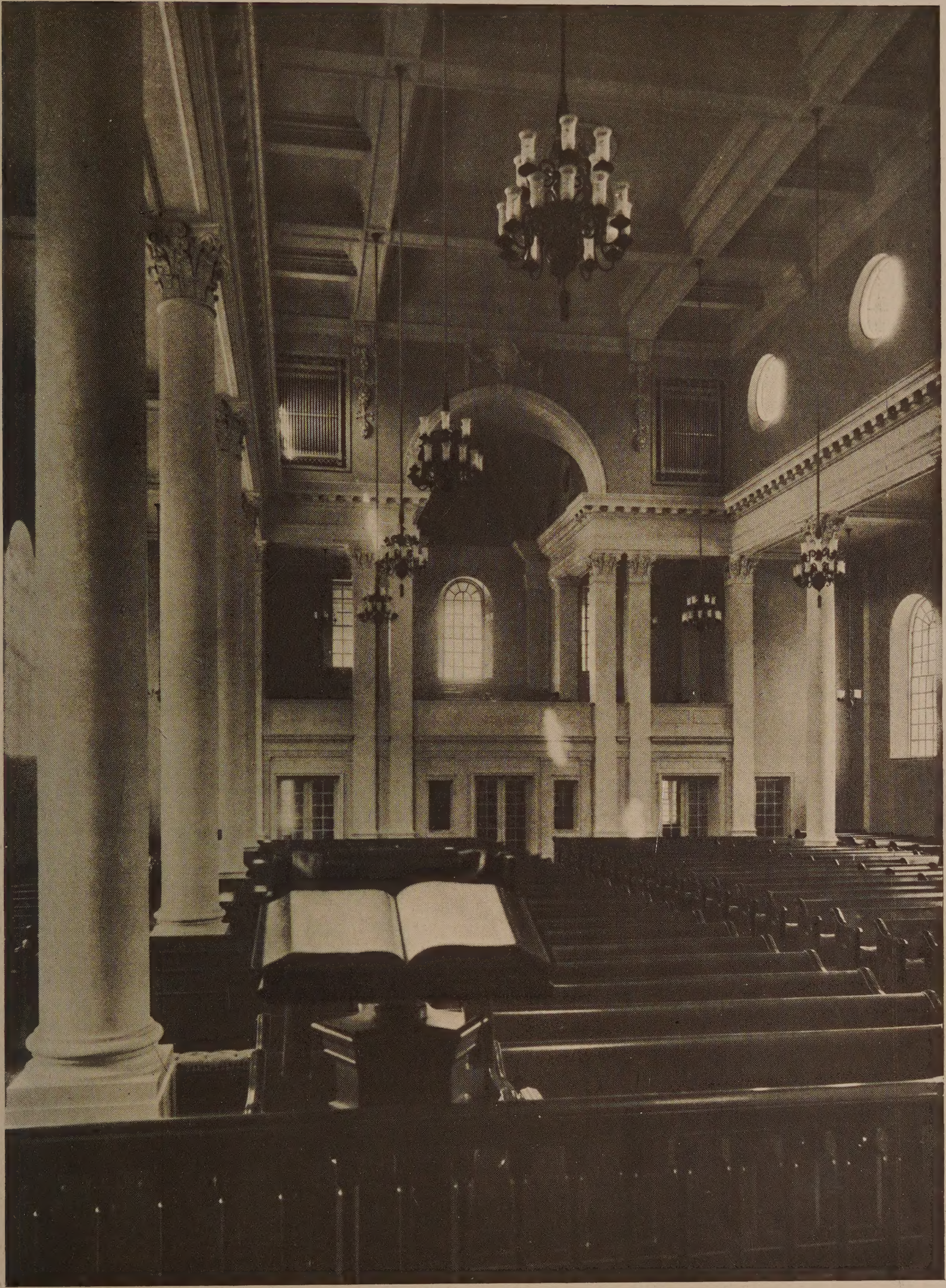


CHANCEL.



Cram & Ferguson, Architects; Rushmer & Jennison, Associate Architects.

FIRST PRESBYTERIAN CHURCH, UTICA, N. Y.



NAVE TOWARD FRONT ENTRANCE, FIRST PRESBYTERIAN CHURCH, UTICA, N. Y.
Cram & Ferguson, Architects; Rushmer & Jennison, Associate Architects.

A Competition

An Historical Device for the Octagon House of the A. I. A., Washington, D. C.

Eligible to compete: Any architectural draftsman.
Date for submission: Before April 1, 1925.
Drawings required: One sheet, scale 3″ = 1 foot.

Prizes:	1st	$100.00
	2d	50.00
	3d, 4th, 5th, 6th, and 7th, each	10.00
	and honorable mentions.	

Foreword

The Octagon House, the Washington, D. C., headquarters of the American Institute of Architects, is a building of great historic and architectural interest. It is, however, so located that the passer-by ofttimes does not see the old mansion or realize the interest which it possesses.

It has been suggested that it would be well to place in suitable relationship to the building and the two streets on which it faces, an appropriate device combining the elements of beauty, dignity, and durability which will call attention to the building and will furnish information to all interested in the architecture and history of the country.

In order to secure a design for such a device, the Building Committee of the American Institute of Architects hereby institutes a competition open to all draftsmen and will award prizes to the designs adjudged worthy under the terms of the programme for this competition as set forth hereinafter. Each competitor is privileged to associate with himself a sculptor, metal worker, writer, and/or any other artist or craftsman.

Competition designs may be submitted anonymously any time before April 1, 1925, and without previous notice.

History of the Octagon House

The following outline of the story of the Octagon House will serve as a background for this competition:

The Octagon House, an exemplar of the fine mansions of the period, was built in Washington on the advice of General Washington by his friend, Colonel John Tayloe, of Virginia. The house was designed by Architect Wm. Thornton (1761–1828), who was the successful competitor for the United States Capitol and who, at Jefferson's request, made designs for the University of Virginia. The house was erected 1798–1800, and became renowned for its hospitable entertainment of persons of distinction. Thornton (1794–1802) was one of three commissioners of the District of Columbia, and had charge of executing the plan of the city of Washington. From 1802 to 1828 he was Superintendent of Patents. His memory is respected by the profession for his meritorious and refined work on the United States Capitol and for his share of early work done in laying out the city.

In 1814, when the British burned the White House, President James Madison occupied the Octagon House, and there Dolly Madison dispensed the hospitality of the Executive Mansion. There was signed the Treaty of Ghent, which ended the War of 1812. The Institute possesses the treaty table, which stands in the circular room where the ceremony occurred.

The building is of such interest and beauty that a monograph of it has been published. One of the plaster cornices has been reproduced in the new American wing of the Metropolitan Museum.

It was Chas. F. McKim who discovered the Octagon House as a home for the Institute. With the active and generous help of Cass Gilbert and other leaders of the profession, the property was purchased from the heirs of Colonel John Tayloe, and since that date, namely, 1902, the Octagon House has been the national headquarters of the American Institute of Architects.

Programme of Competition

The device may be designed of wood or metal or stone, or a combination thereof. The device may be hung from the building, or attached to the walls thereof, or placed on the balustrade surrounding the areaways, or supported free from the building on the ground, or on a pier or posts.

In the case of a design requiring support, the supporting pier, posts, or brackets should form part of the design.

Factors which will be considered by the jury in making awards are:

1. Beauty and appropriateness of design and suitability of material.
2. Inscription, selection of facts, and their wording and presentation.
3. Taste and judgment exercised in size, placement, and legibility viewed from the sidewalk or street.

In view of the history of the Octagon House and its present occupancy, the competitors may at discretion include in their designs the seal of the United States and the seal of the American Institute of Architects.

The drawings, which shall not exceed 24 inches by 36 inches in size, should show the design at 3 inches to the foot in direct elevation, sections or perspective sketches at any scale being included if desired by the competitor. Drawings shall be on white paper in any rendering. Drawings shall be delivered to D. Everett Waid, president of the American Institute of Architects, 1 Madison Avenue, New York City, on or before April 1, 1925.

All drawings shall be sent flat and with each shall be enclosed in a plain opaque, sealed envelope without any superscription or mark of any kind, the name and address of the competitor. These envelopes shall be opened by the chairman of the Building Committee after the final award has been made.

Prize-winning designs will be exhibited in the Exposition of Architecture and Allied Arts at the Grand Central Palace, New York, April 20 to May 2, 1925.

The Building Committee shall have the option of using any design or suggestion presented in this competition for the expressed purpose of the competition and upon according due credit to the authors.

The drawings submitted will be judged by the Building Committee of the American Institute of Architects, who will award the prizes in order of rank determined by them. They may, in their discretion, award also honorable mentions.

(Signed) The Building Committee.

Frederick L. Ackerman, William P. Barney, Edwin Bergstrom, Glenn Brown, D. H. Burnham, J. E. R. Carpenter, E. W. Donn, Jr., Albert Kahn, William M. Kendall, Fiske Kimball, Robert D. Kohn, O. J. Lorehn, E. P. Mellon, Charles A. Platt, Howard VanDoren Shaw, A. H. Stem, Seth J. Temple, A. M. Welch, D. Everett Waid, *Chairman.*

Copies of the Competition Programme may be had without charge by addressing the secretary of the American Institute of Architects, the Octagon House, Washington, D. C.

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Editorial and Other Comment

Saving Grace

IT is hard for many of us to see beyond the immediate bird in hand, to realize that, in spite of all the very obvious selfishness and greed of modern life, here and there are indications that we are even yet not without some very real capacity for following ideals. The war brought to all concerned in it the feeling that humanity, civilization, Christianity had been tested and found wanting. The old primitive man had been waiting for the opportunity and the permission to revert to type and become as the beasts of the field. How short a time it has taken, though, to almost forget wartime bitternesses and to assume an attitude of tolerance, even forgiveness, toward enemies. More than anything else, we are inclined to think that much of this is due to a keen realization of the fact that the old lines of national and racial separation have been removed from the map and that mankind has learned through terrible suffering the lesson of mutual dependence.

No longer can such a power as Germany was threaten the world with ruthlessness, and, if nothing else can prevent war, the great lesson of the material losses involved, even to non-combatants, the mere matter of business, may make even the boldest stop and consider.

But we take heart of grace and dare to look beyond the matter of the penny profit of the day when we contemplate such things as the raising of fifteen millions of dollars for the completion of a great Protestant cathedral, with people of all races and religions giving of their little or abundance, and the spending of another ten millions for the building of a gigantic medical centre.

Religion and the amelioration of physical suffering; ministering to the spirit and the body.

We are probably no more given to yielding to our emotions than other peoples, but once you get the Americans well started they usually go the limit.

The cathedral promises to be one of the great churches of the world, a thing of beauty, dignity, and impressive mass. In time it will acquire the glamour of age, become rich in traditions of the designers and the men who labored in the trades and arts to make it what it should be.

The medical centre, to judge from the architect's drawing, will be modern in its lines, with stress put upon the need for light and air. The architect, Mr. James Gamble Rogers, is perhaps best known for the buildings of the Harkness Memorial at Yale.

It is pleasant to note that Mrs. Stephen Harkness and her son, Edward S. Harkness, donors of the beautiful Harkness Memorial, have made this development possible by their generous gift of the site as well as money.

The immense sums involved in these two enterprises would have seemed of startling proportions a few years ago, but we have been taught that mere figures in terms of cash no longer are a matter of moment, and there seems absolutely no limit to the money that can be raised when an appeal is made to our practical sentimentalists.

Quite apart from their spiritual significance, these two great buildings are going to afford work for a large number of men, from the humble day laborer who may carry a hod or shovel sand to the highly skilled artisans and craftsmen to whose loyalty and pride in good work we shall owe very much more than the wages they will be paid.

We remember Mr. Rogers's saying, when the Harkness Memorial was going up at Yale, that the success of the work could be largely credited to the skill, intelligence, and pride of every workman concerned. We shall have in the building of the new cathedral, we believe, just as much devotion to good work and honest craftsmanship as we are accustomed to attribute to the builders of Rheims or any of the older English cathedrals.

Chicago's Great Furniture Mart

WE present in this number the largest reinforced concrete building in the world. Of course, it is in Chicago; they have a way of doing big things there. Some of our readers may remember that the World's Fair was held there and that one of the buildings survives to-day, dilapidated to be sure, but capable of restoration, a thing of classic beauty in a city that is associated with other things chiefly.

In the Furniture Mart, by Mr. Raeder, associated with George C. Nimmons & Co. and N. Max Dunning, we are shown a building for these times, a building given to the exhibition and sale of furniture, a business building with little pretense to architectural beauty, but achieving it in many ways by sheer mass and nicely adjusted proportions.

We confess we never cease to wonder at the daring, the invention, and the assurance that begin with the inception of such a problem and carry through all of the complicated engineering and structural details to a successful finish.

It is all in the day's work for the modern architect and engineer, and they are ready for any undertaking when the time arrives and the proper and assured amount of capital is forthcoming.

The Small House

WE wish to express our thanks and appreciation for the many kind and suggestive letters we have received in response to ours asking for ways to improve ARCHITECTURE and make it of more value to the profession. An editor must be, if he is alive to the times, first of all a man with a good pair of listeners and a capacity for gathering ideas from wiser folks. He can't know it all, neither can he follow all of the suggestions made in a single number of a magazine. We shall try in the course of time to put over every sound suggestion that comes to our hand, and we ask your indulgence if your particular pet doesn't materialize in the very next issue.

Letter after letter asks us for more good small houses. Some want houses "that can be built for five thousand dollars or a little more," and we wonder how it can be done and where. We understand that the spring exhibition of the Architectural League, to be held at the Grand Central Palace, New York, from April 20 to May 2 in connection with the meeting of the American Institute, will stress the small house. Needless to say we are only too glad to publish small houses of good design, and though we try very hard to find those that can be built at something near pre-war prices, the search is futile. "There ain't no such animile."

The Artist and the Architect

William L. Steele's Words of Wisdom on the Subject

THAT old idea that an architect is, or ought to be, an artist lies closest to the root of our difficulty. If we formally renounce it the whole trouble clears up. There is no force in any argument against standardizing the whole works and copying everything. If we are not artists, who can do aught but praise if we follow the line of least resistance, and devote our whole energy to reducing the cost of production, which copying certainly does? But somehow the old idea persists, and though some of us ignore it and some assume it, jackdaw-like, others of us are worried about it. It is more or less believed by members of the profession and people generally that an architect becomes an artist when he becomes an architect. If we could only abandon that superstition "once and for all" we might be able to start all over again and get somewhere. The trouble started early. We studied art, or thought we did. We really took lessons in drawing or painting or clay modelling. And then we studied architecture. We were made to suffer mental indigestion when it came to the study of the work of the past ages. We were crammed full of it. We were overwhelmed by it. As Louis Sullivan said, "we were taught hero-worship but not what the heroes themselves worshipped." We were kept so busy drawing and memorizing the highly developed forms which building materials had assumed under the hands of the long dead master-craftsmen that no time was left for an attempt at our own interpretation of the nature forms which suggested all the art forms that ever were. Nor did we sense much of the nature, substance, and limitations of the materials with which we would some day have to deal. Nor did we get any real insight into the way the actual work would have to be done after we got through drawing the picture. Worst of all, we were denied in most cases any hint of the joy and delight which must have gladdened the heart of the masters when they created the buildings whose "pale presentiments," like pictures of dead butterflies, were passed before us. When we were graduated we had acquired a smattering of a great many subjects, but that we had any real, authoritative grasp of the fundamental and vital principles of architecture may be seriously questioned. Many of us had not even acquired a personal "touch" or technic as draftsmen. And yet we were graduates from a course in architecture! I wonder what the effect on architecture as we know it would have been if we had been merely passed with satisfactory evidence of having taken a course of study leading toward architecture. Many a man whose diploma gave him courage to essay immediate independent practice might have hesitated. The men who had to "make good" in independent practice without an opportunity of an apprenticeship in the office of a master of the profession were forced to draw freely on "precedent," for they had nothing else. Mastery of design cannot be taught in school. It must be self-acquired by years of work under the guidance of some one who is *teaching* by *doing* the thing taught.

Architects Tour

IT gives us pleasure to announce that Professor Albert C. Phelps, College of Architecture, Cornell University, will again be in charge of one of the most interesting and instructive of European tours. He writes us that:

"The work during the past two seasons has been so successful that I have been encouraged to continue it in conjunction with the Bureau of University Travel, whose reputation for scholarly and efficient travel management is well known. The same careful selection of personnel and promotion of good fellowship that have conduced so greatly to the success of the previous tours will be observed this year.

"While the tour is designed especially for practising architects and architectural students, a limited number of persons who may wish to study architecture and the other fine arts for their cultural value will be admitted to membership.

"The programme of the group is comprehensive, it being assumed that all members are interested in painting, sculpture, architecture, archæology, history, etc., and due attention is given to all of these subjects by each section. So far as practicable, however, both the groups and their leaders are specialized along these several lines. Leaders will interchange with a view to giving to each section the benefit of their special knowledge. Professor Phelps will lecture upon architecture to each division in turn and his associates will do the same in their special subjects."

Address Cornell Branch, College of Architecture, White Hall, Ithaca, N. Y., Miriam H. Flick, Secretary, or Bureau of University Travel, 11 Boyd Street, Newton, Mass.

S. B. P. Trowbridge

IN the death of S. Breck Parkman Trowbridge, the profession has lost one of its most distinguished members and a man to whom we owe much for his constant efforts in the advancement of art.

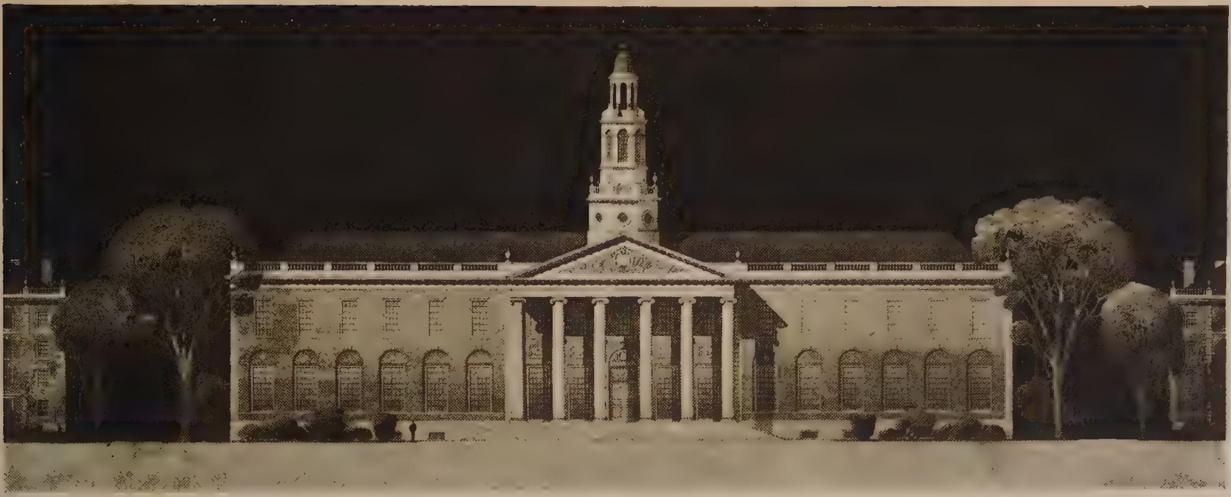
Mr. Trowbridge was born in New York May 20, 1862, the son of Professor William P. and Lucy Parkman Trowbridge. He was graduated from Trinity College in 1883 and from Columbia University School of Architecture in 1886. He received the degree of M.A. from Trinity in 1891 and that of Sc.D. from Trinity in 1910.

Following his graduation from Columbia, he was sent to Greece by the Archæological Institute to superintend the erection of the building of the American School of Classical Studies in Athens. From Athens he went to Paris, where he studied in l'Ecole des Beaux Arts.

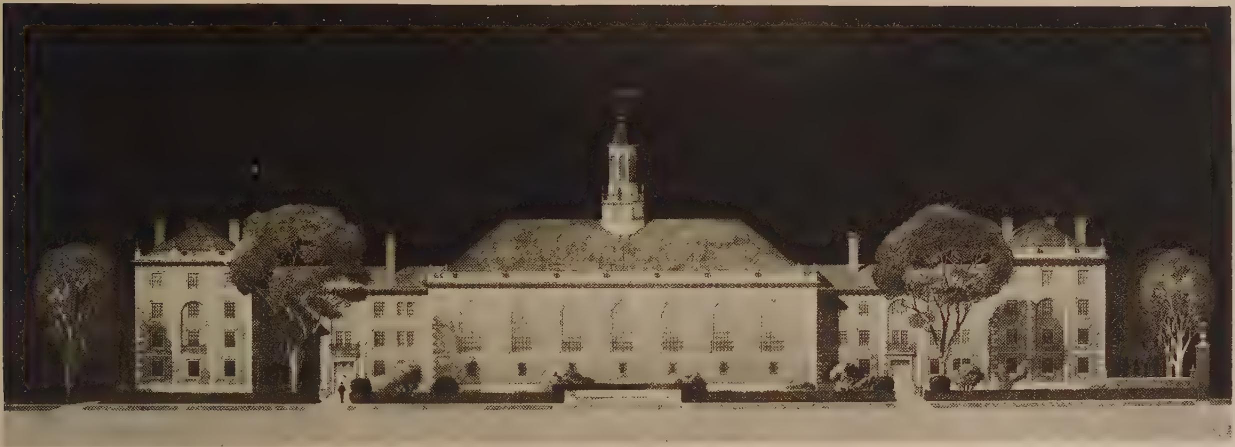
Returning to New York, he spent four years in the office of George B. Post, after which he became associated with Goodhue Livingston in the firm of Trowbridge & Livingston, of which he had been a member for thirty years at the time of his death. He was married to Sophia Pennington Tailer, of New York, on January 26, 1896.

Among the buildings for whose design Mr. Trowbridge was responsible as a member of the firm of Trowbridge & Livingston are the Bankers' Trust Company Building, the addition to the New York Stock Exchange, the banking house of J. P. Morgan & Co., the Chemical National Bank, the Mellon National Bank of Pittsburgh, the Bank of America, now under construction in Wall Street; the new Equitable Trust Company Building, to be erected at Broad Street and Exchange Place; the Mitsui Bank of Tokio, and the Altman building in Thirty-fourth Street, New York City.

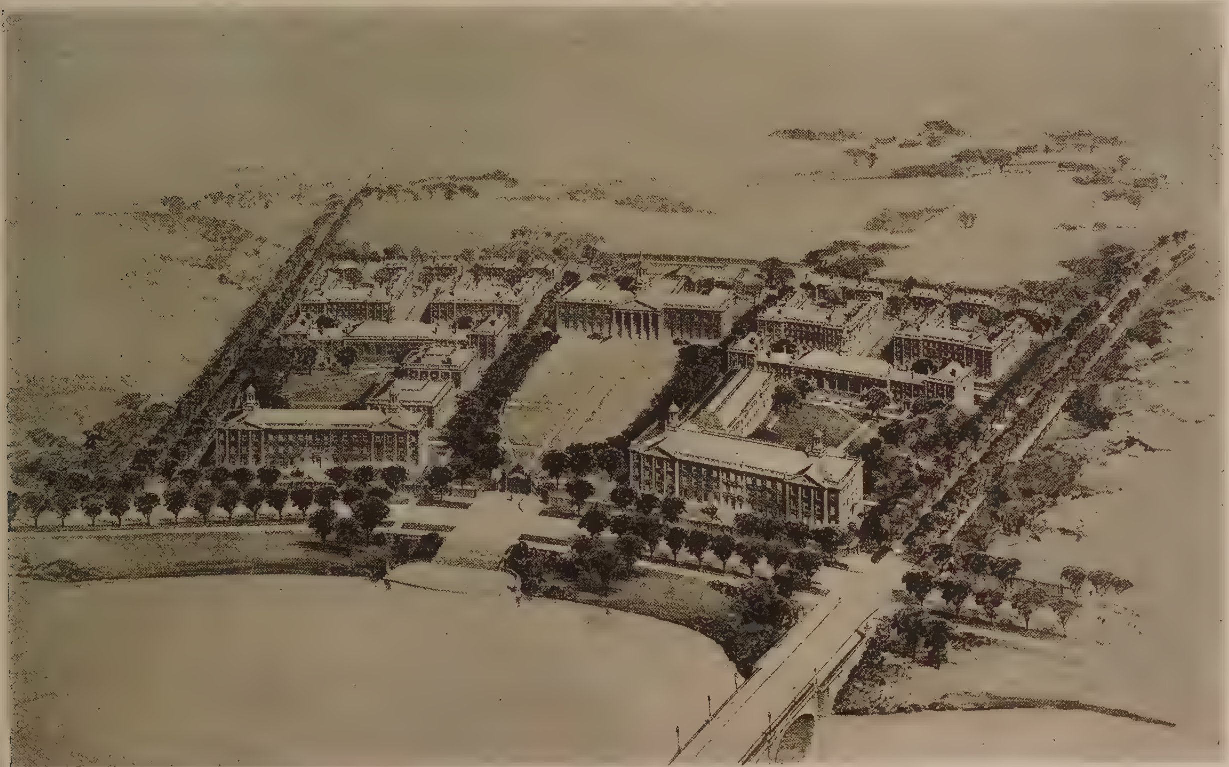
He was an incorporator, vice-president, and trustee of the American Academy in Rome, a Fellow of the American Institute of Architects, and a member of the National Institute of Arts and Letters, the National Academy of Design. He had been president of both the Architectual League of New York and the Society of Beaux Arts Architects.



LIBRARY.



DINING HALLS.

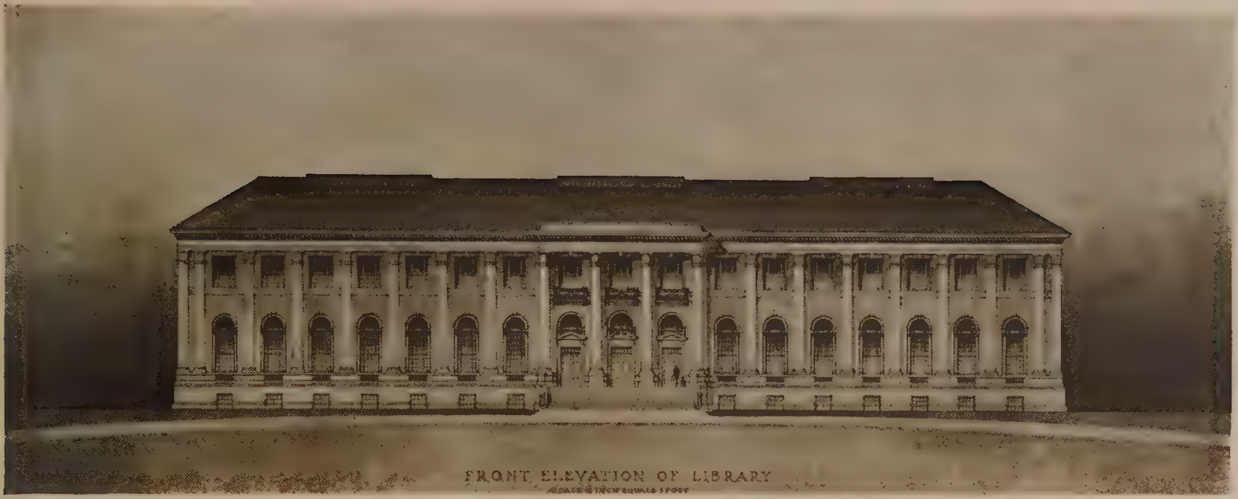


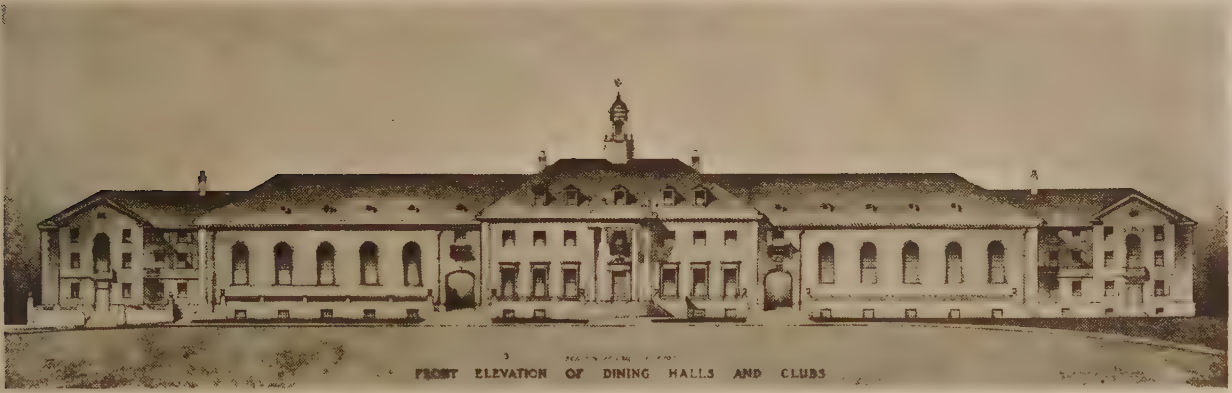
WINNING COMPETITIVE DESIGN.

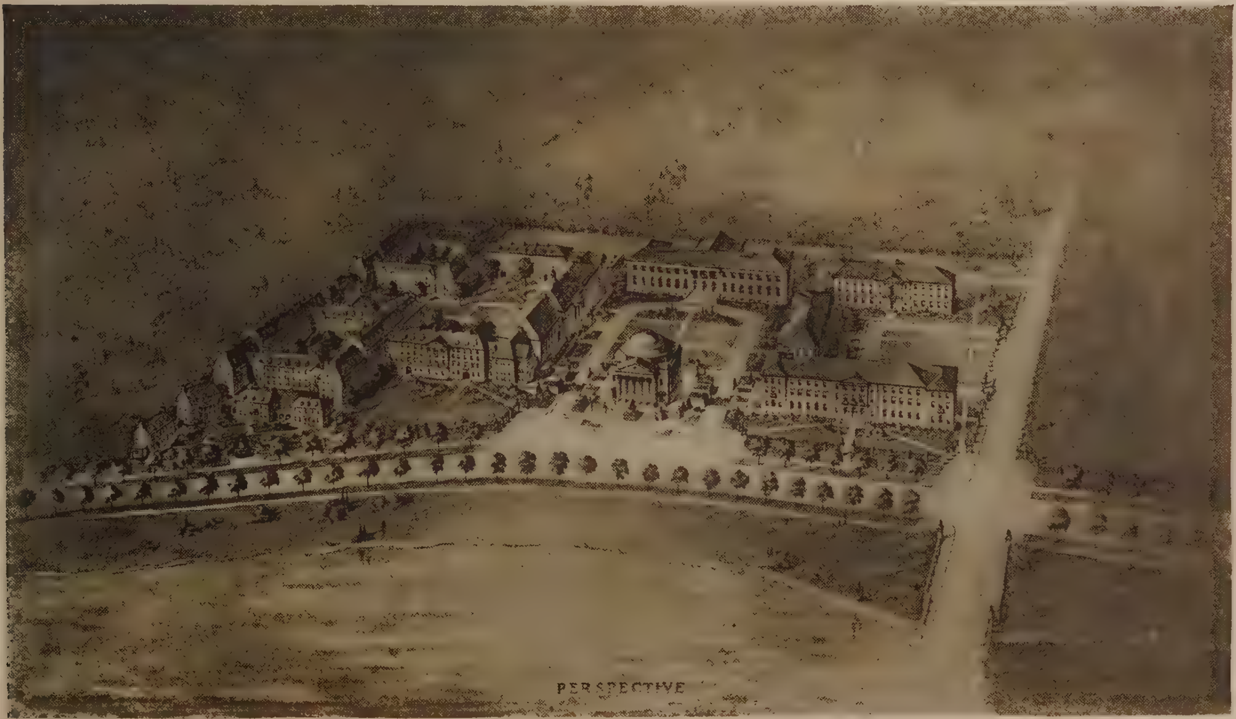
McKim, Mead & White, Architects.

HARVARD BUSINESS SCHOOL.

(All of the other Competitive Designs will be published in later issues.)

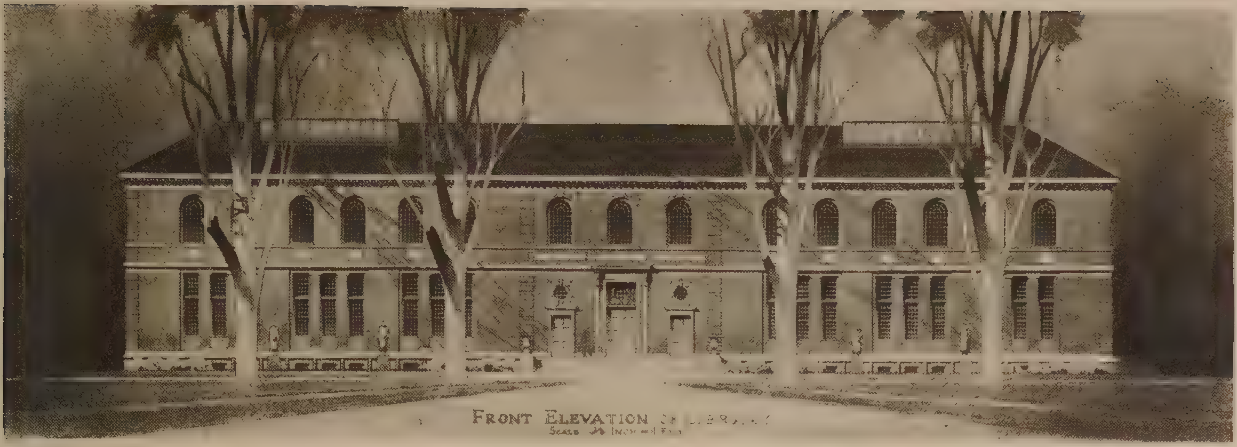


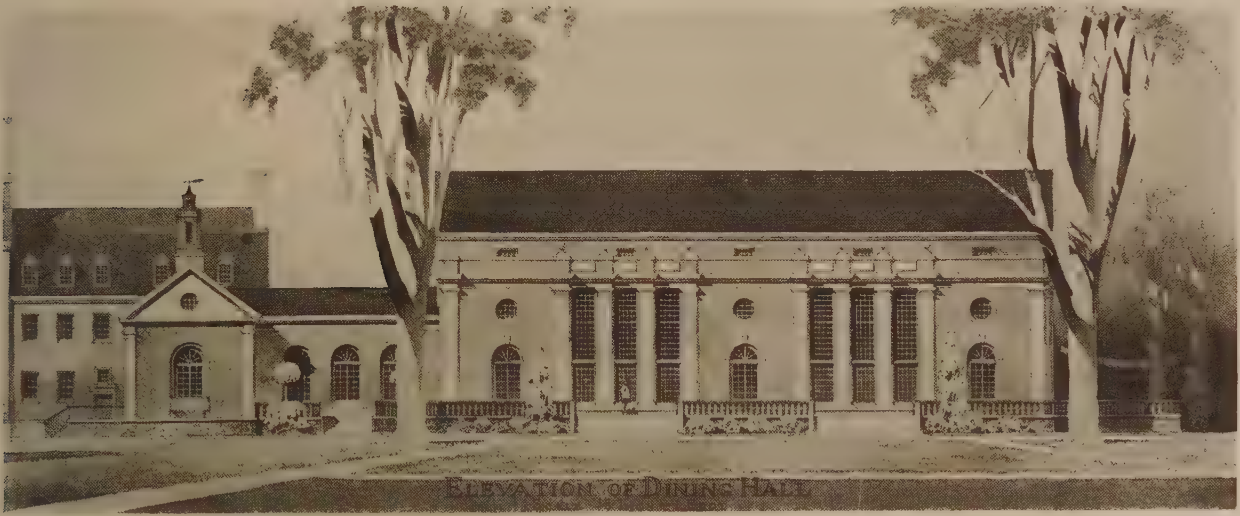


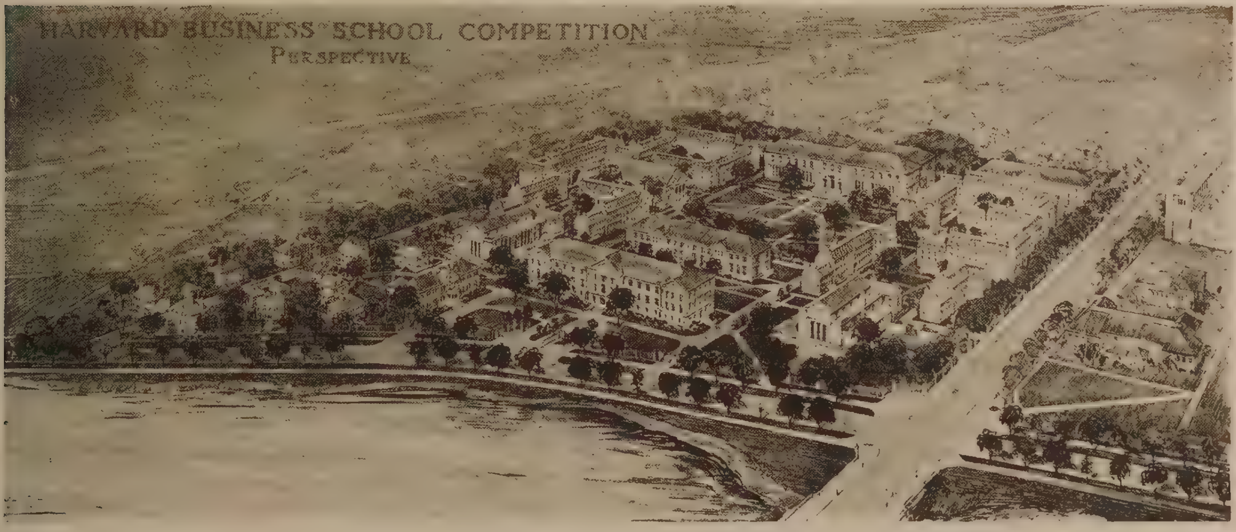


COMPETITIVE DESIGN. Ludlow & Peabody and Harold F. Kellogg, Architects.

HARVARD BUSINESS SCHOOL.

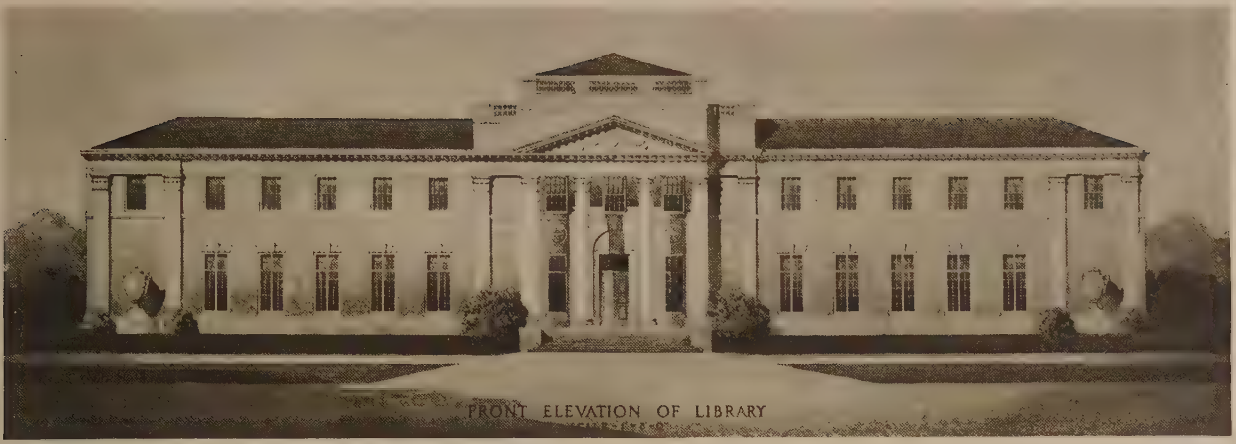


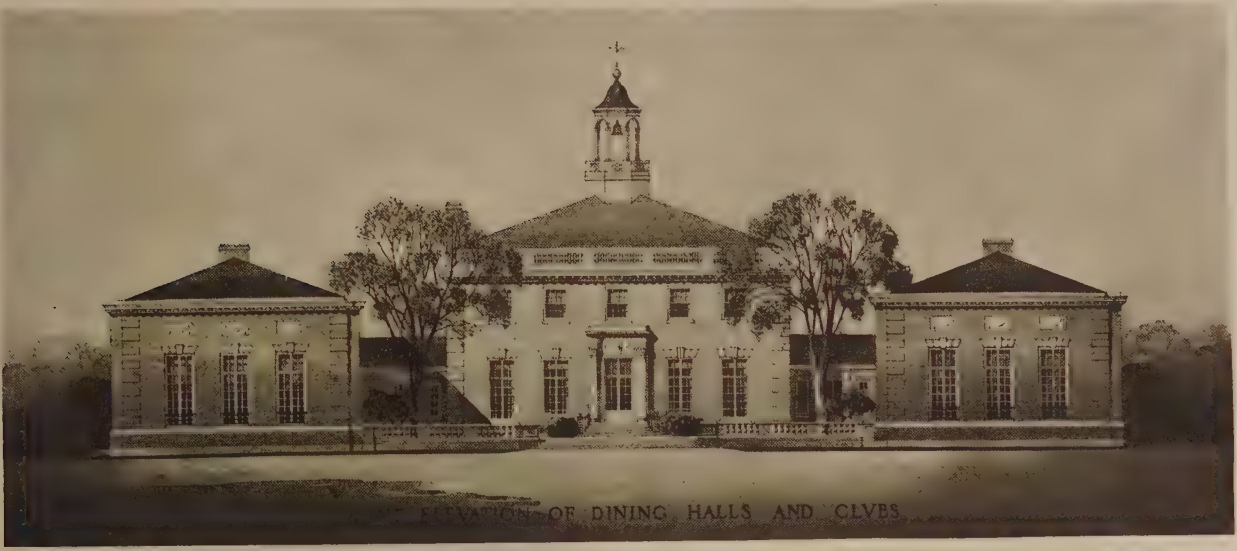


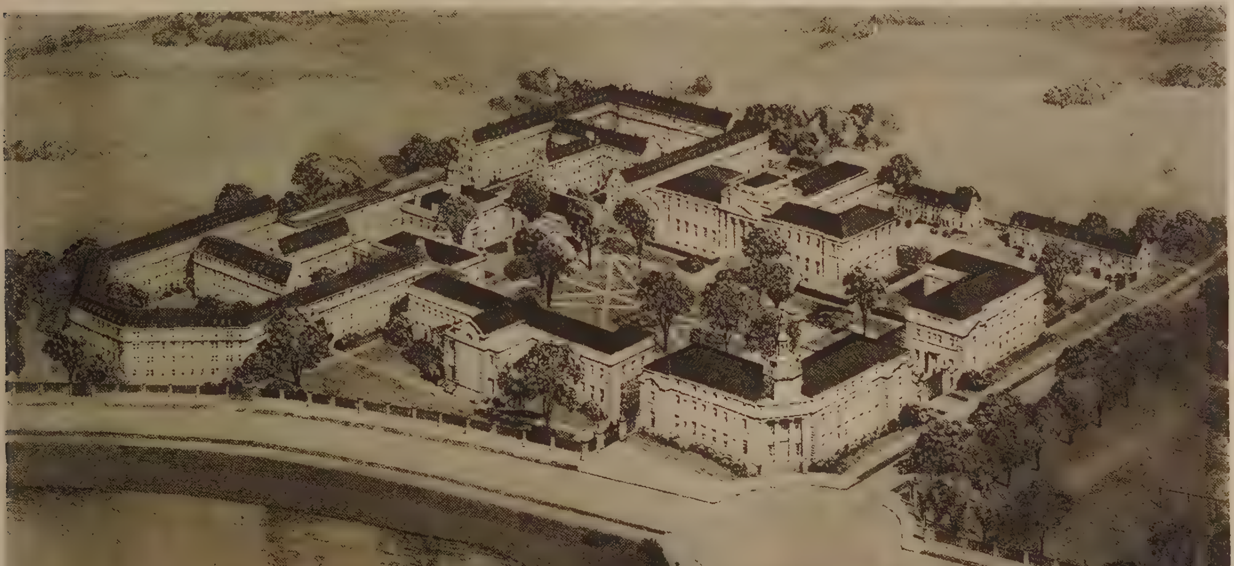


COMPETITIVE DESIGN. J. J. Haffner and Associates, Architects.

HARVARD BUSINESS SCHOOL.



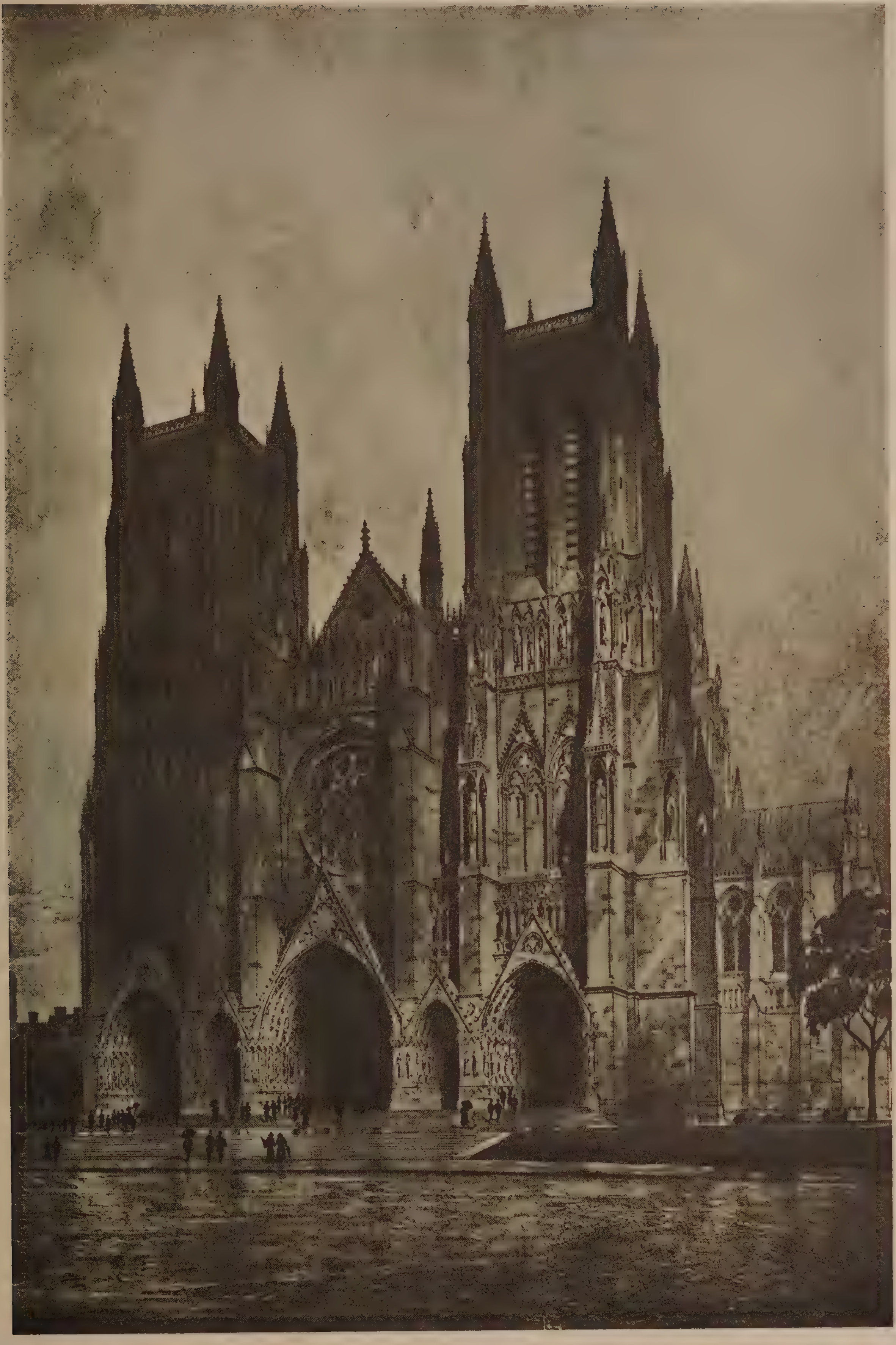

ELEVATION OF DINING HALLS AND CLVBS



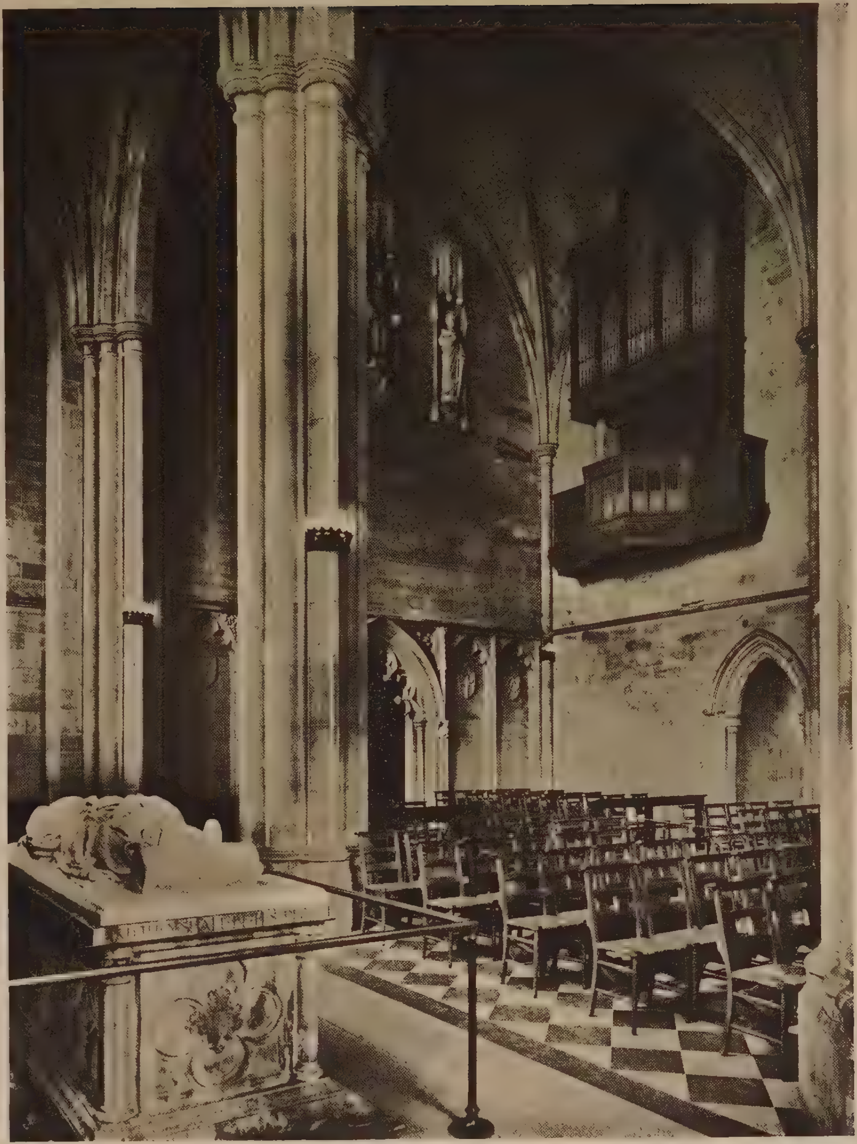
COMPETITIVE DESIGN.

Raymond M. Hood, Architect

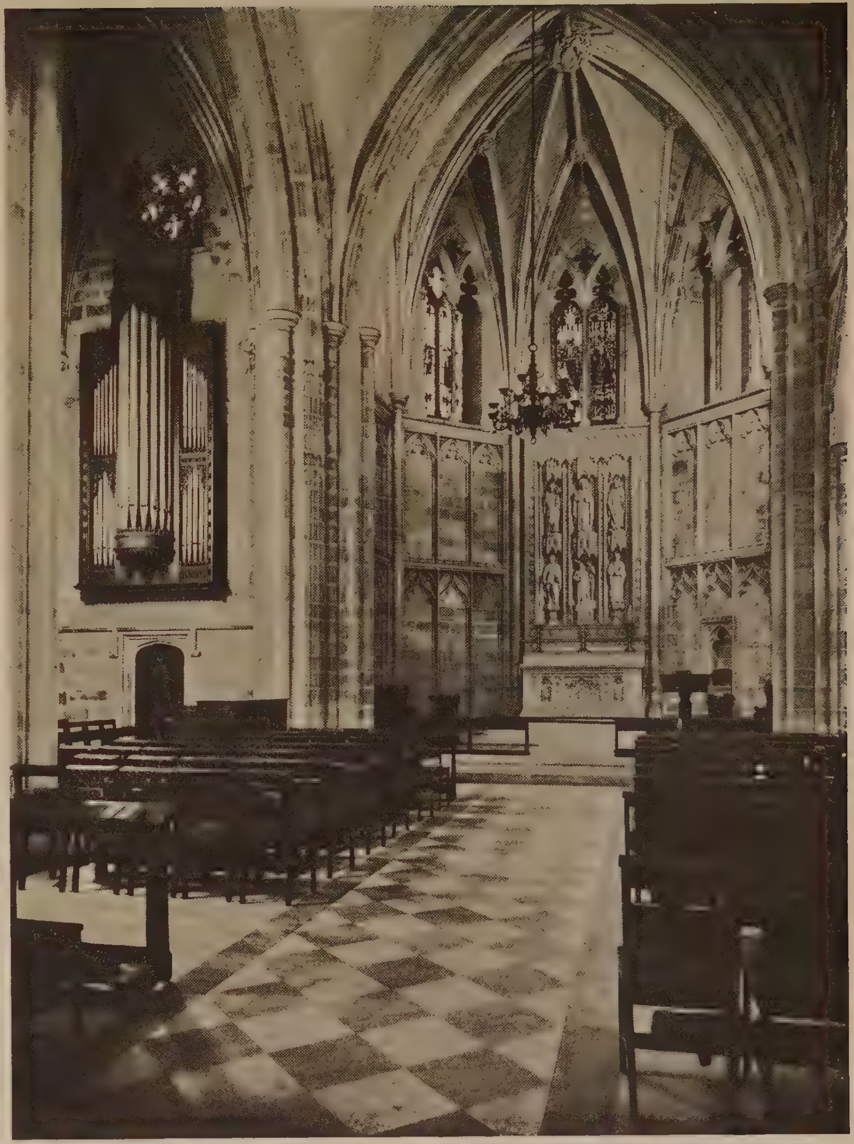
HARVARD BUSINESS SCHOOL.



DESIGN FOR FAÇADE, CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK. Cram & Ferguson, Architects.

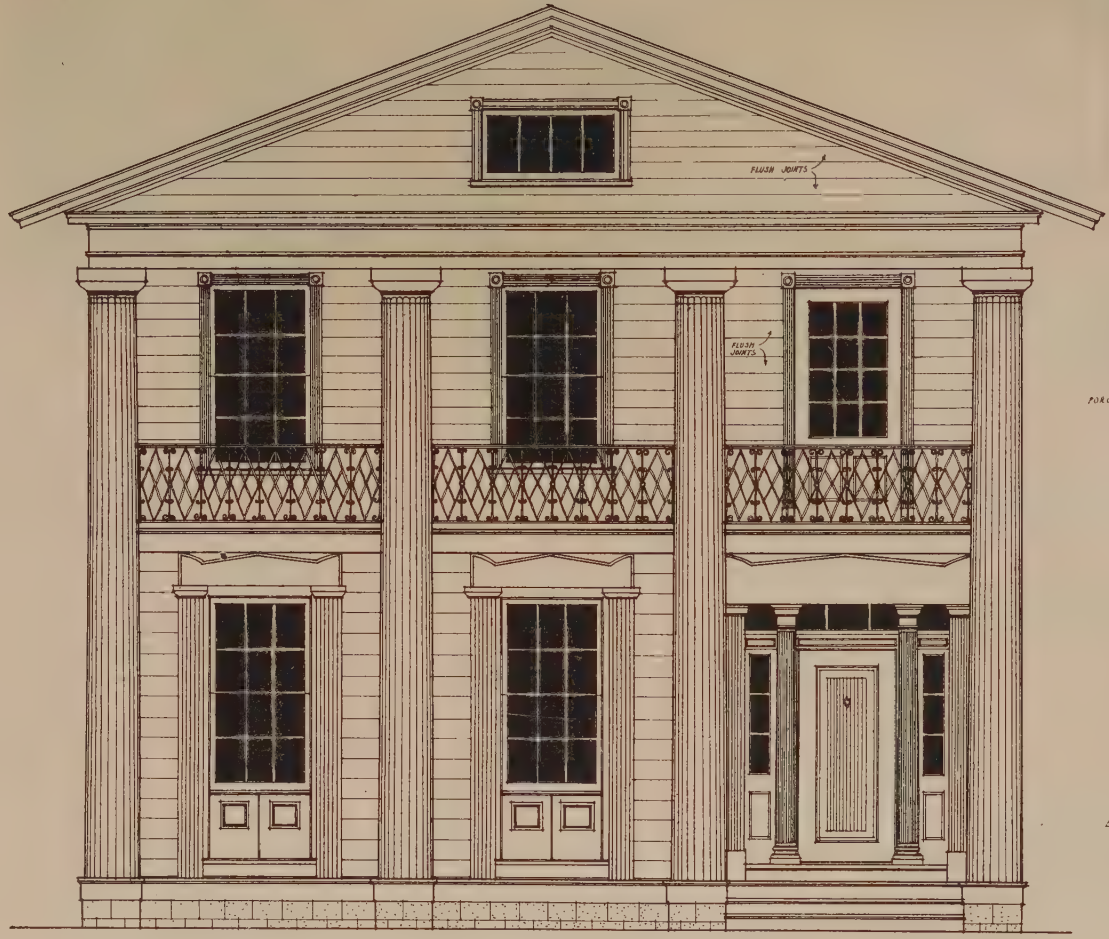


ST. JAMES CHAPEL, 14TH CENTURY ENGLISH GOTHIC.
Henry Vaughan, Architect.

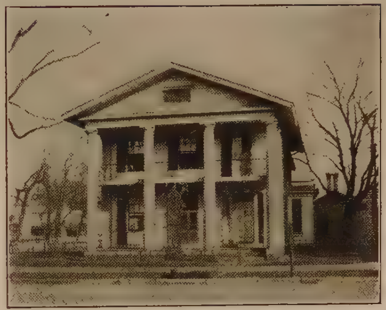


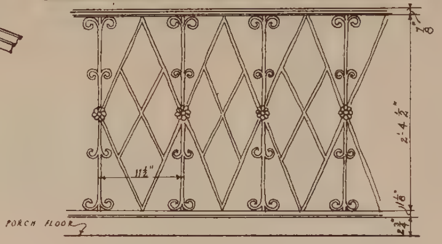
ST. ANSGARIUS (HUNTINGTON CHAPEL), 14TH CENTURY ENGLISH GOTHIC.
Henry Vaughan, Architect.

CATHEDRAL OF ST. JOHN THE DIVINE, NEW YORK.
Cram & Ferguson, Architects.

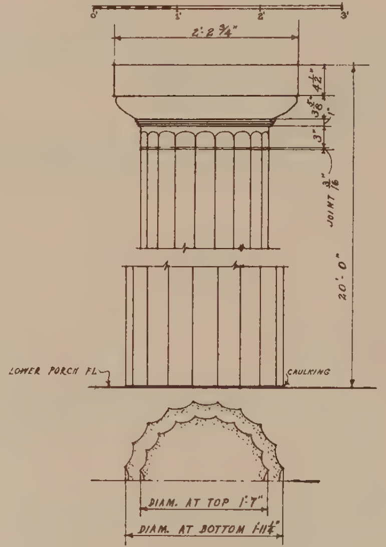


• FRONT • ELEVATION •

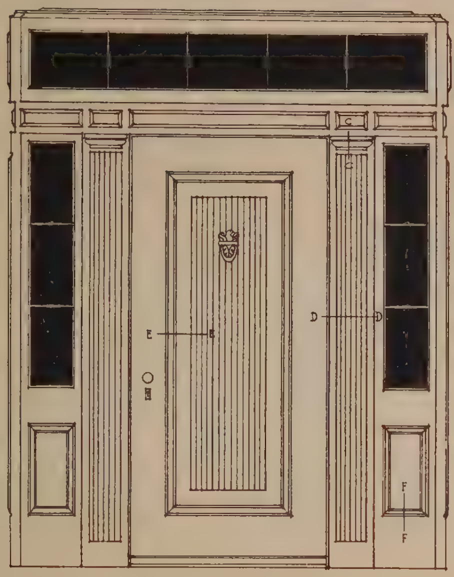




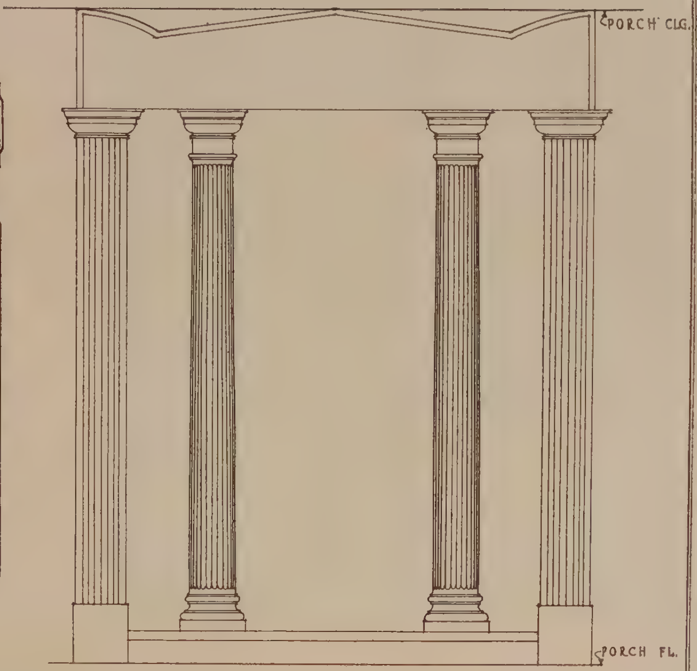
DETAIL · OF · BALUSTRADE ·



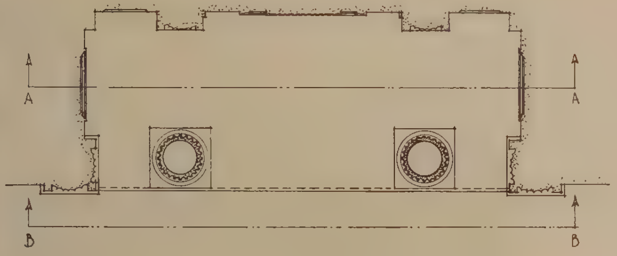
• THE • BUCKINGHAM • RESIDENCE •
· NEWARK · OHIO ·
• MEASURED · & · DRAWN · BY · Daniel W. Weiny



• ELEVATION • ON • LINE • "A-A" •

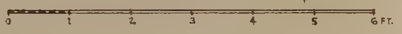


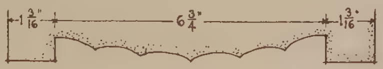
• ELEVATION • ON • LINE • "B-B" •



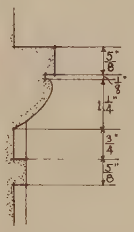
• PLAN •

SCALE · FOR · ELEVATIONS · & · PLAN





SECTION "D-D"



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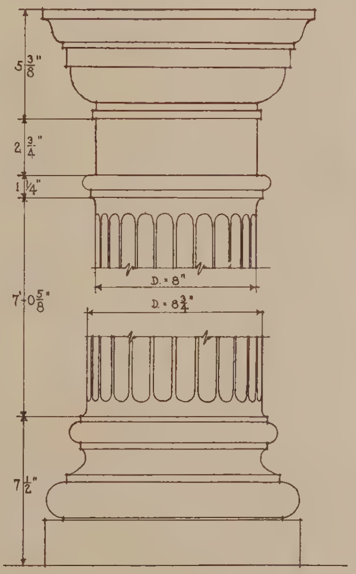
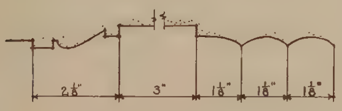
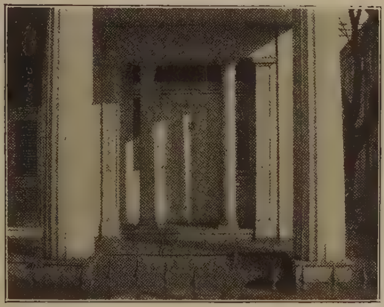
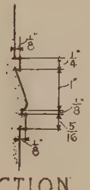




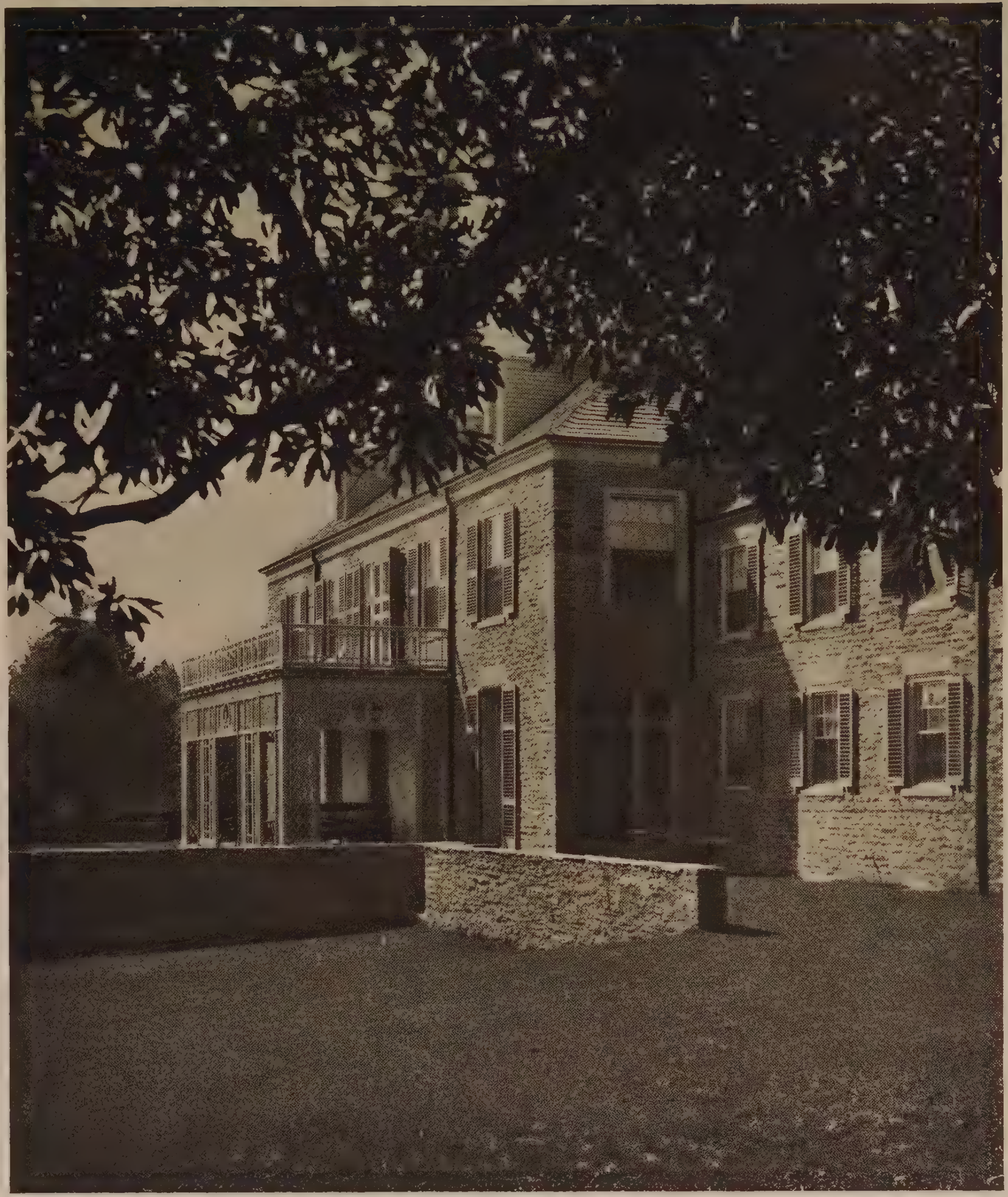
SECTION "E-E"



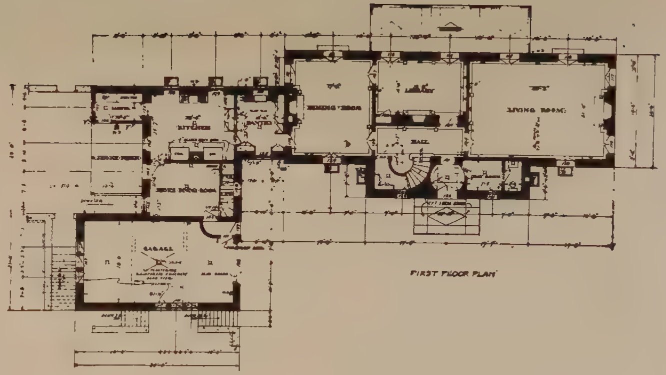


SECTION "F-F"

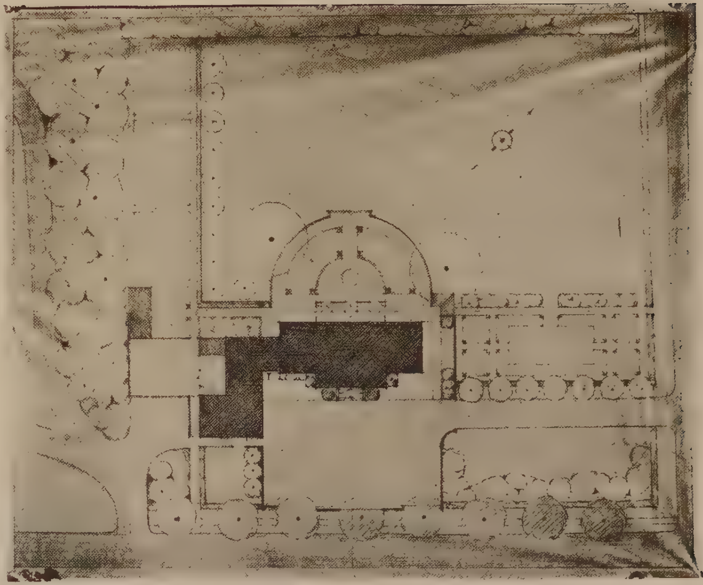
• DOORWAY • TO •
• THE • BUCKINGHAM • RESIDENCE •
• NEWARK • OHIO •
• MEASURED • & • DRAWN • BY • Daniel W. Weiny



RESIDENCE, SCHOFIELD ANDREWS, CHESTNUT HILL, PHILADELPHIA, PA.

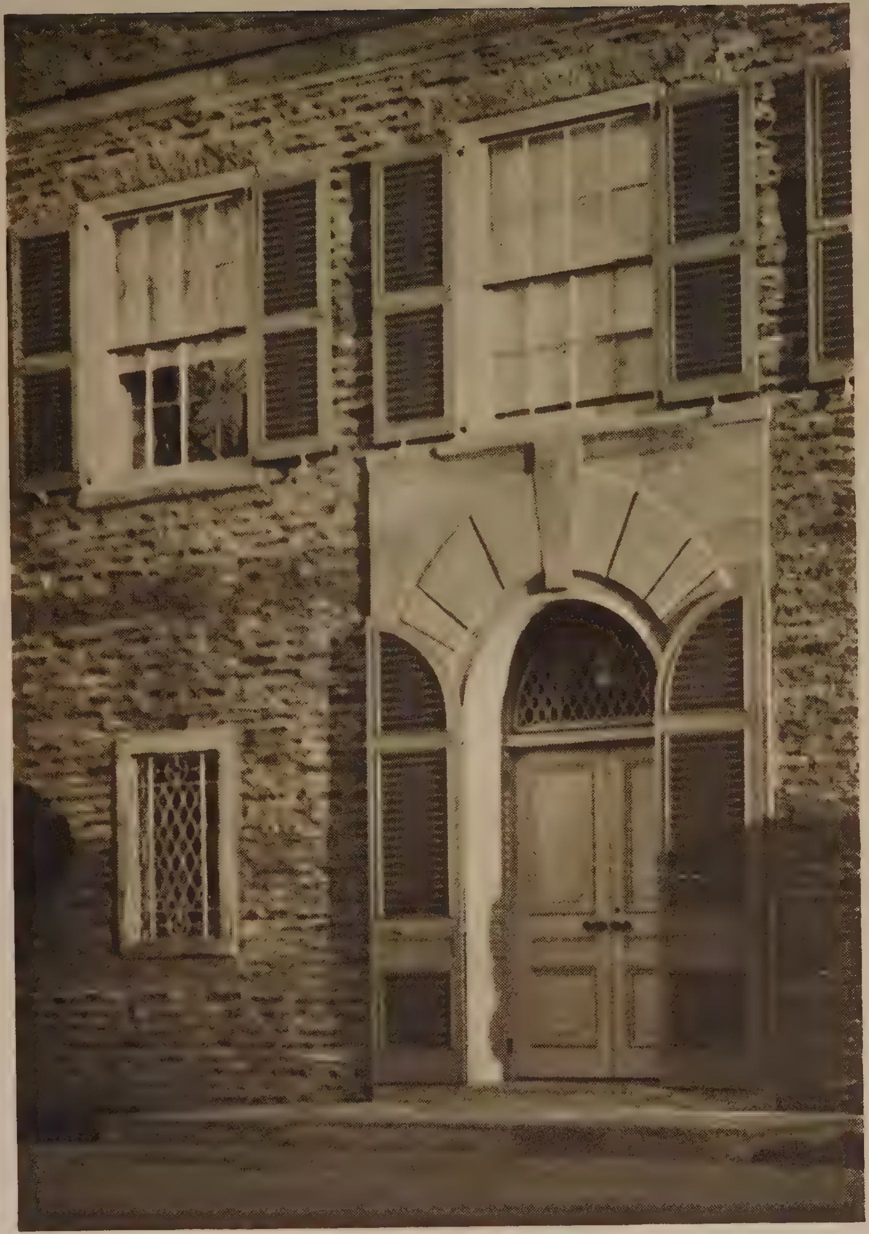


FIRST FLOOR PLAN

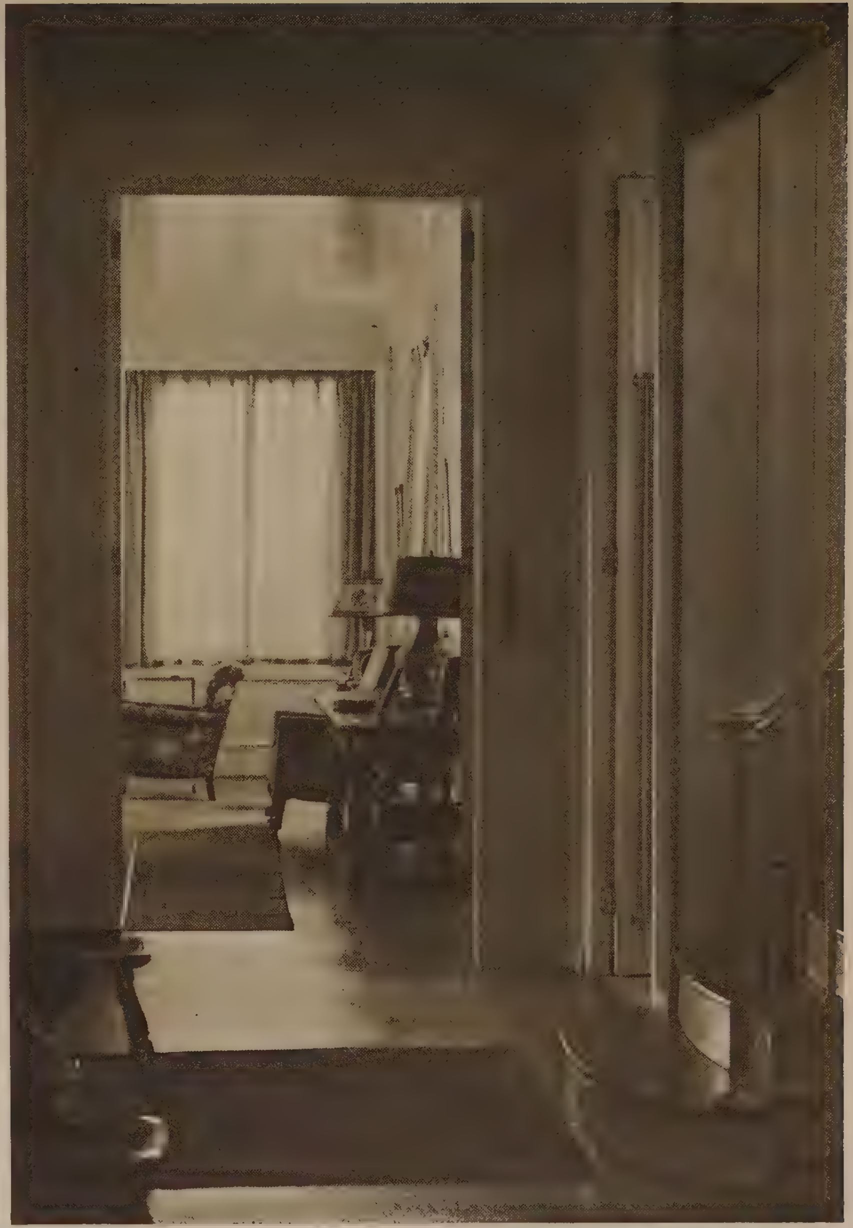


PLOT PLAN.

Edmund B. Gilchrist, Architect.



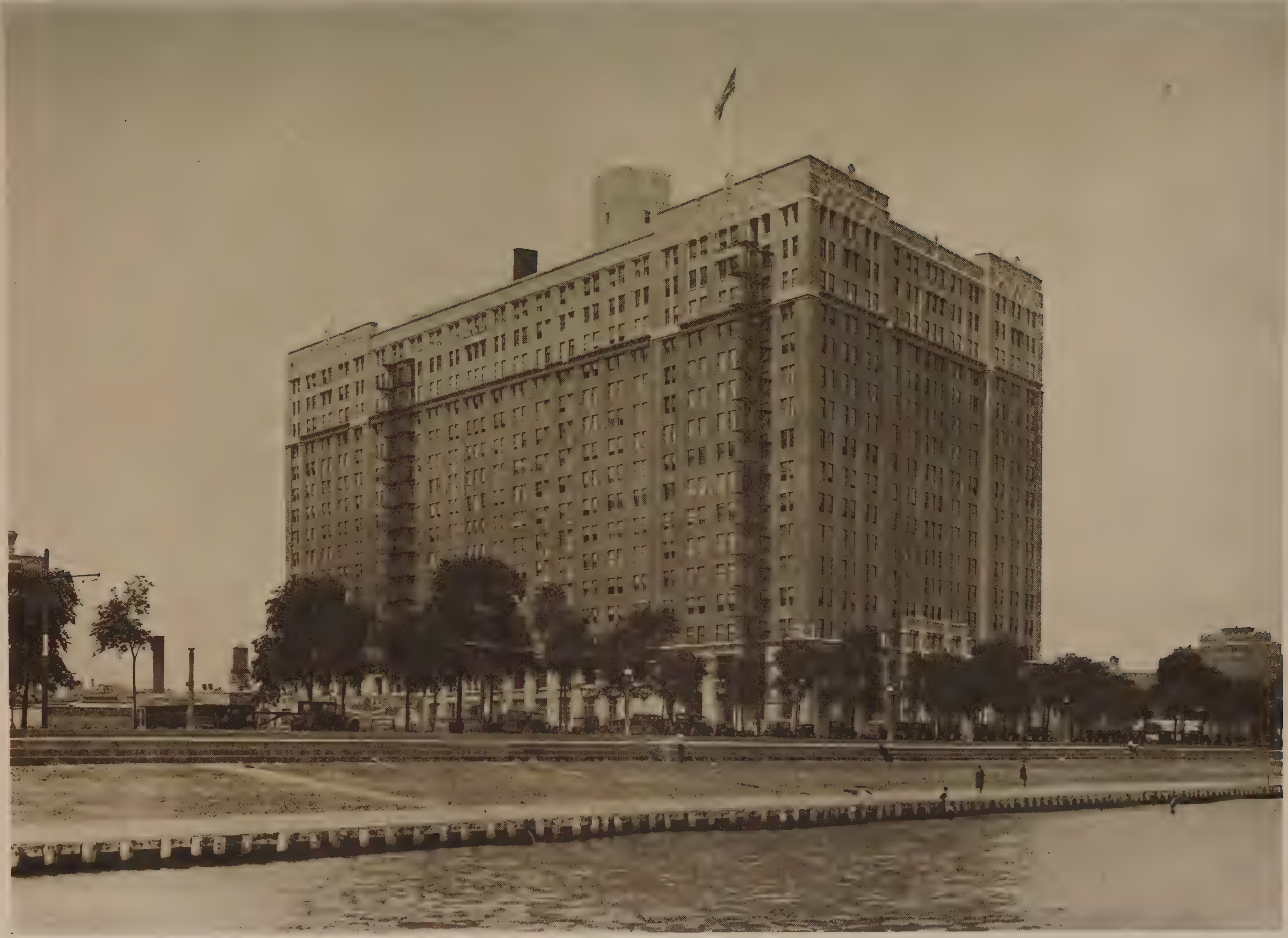
ENTRANCE DETAIL.



HALL TOWARD LIVING–ROOM.

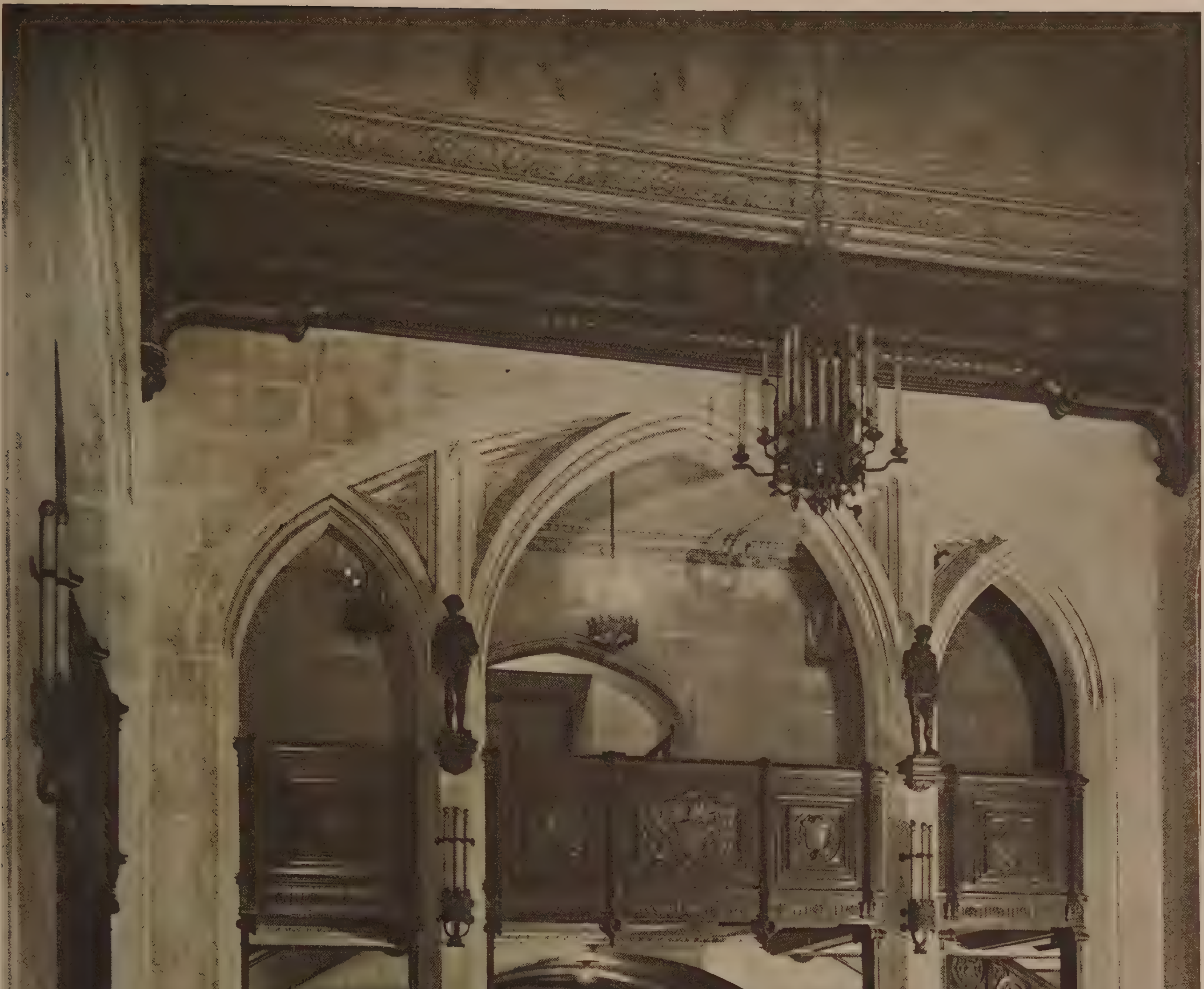
Edmund B. Gilchrist, Architect.

RESIDENCE, SCHOFIELD ANDREWS, CHESTNUT HILL, PHILADELPHIA, PA.



AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

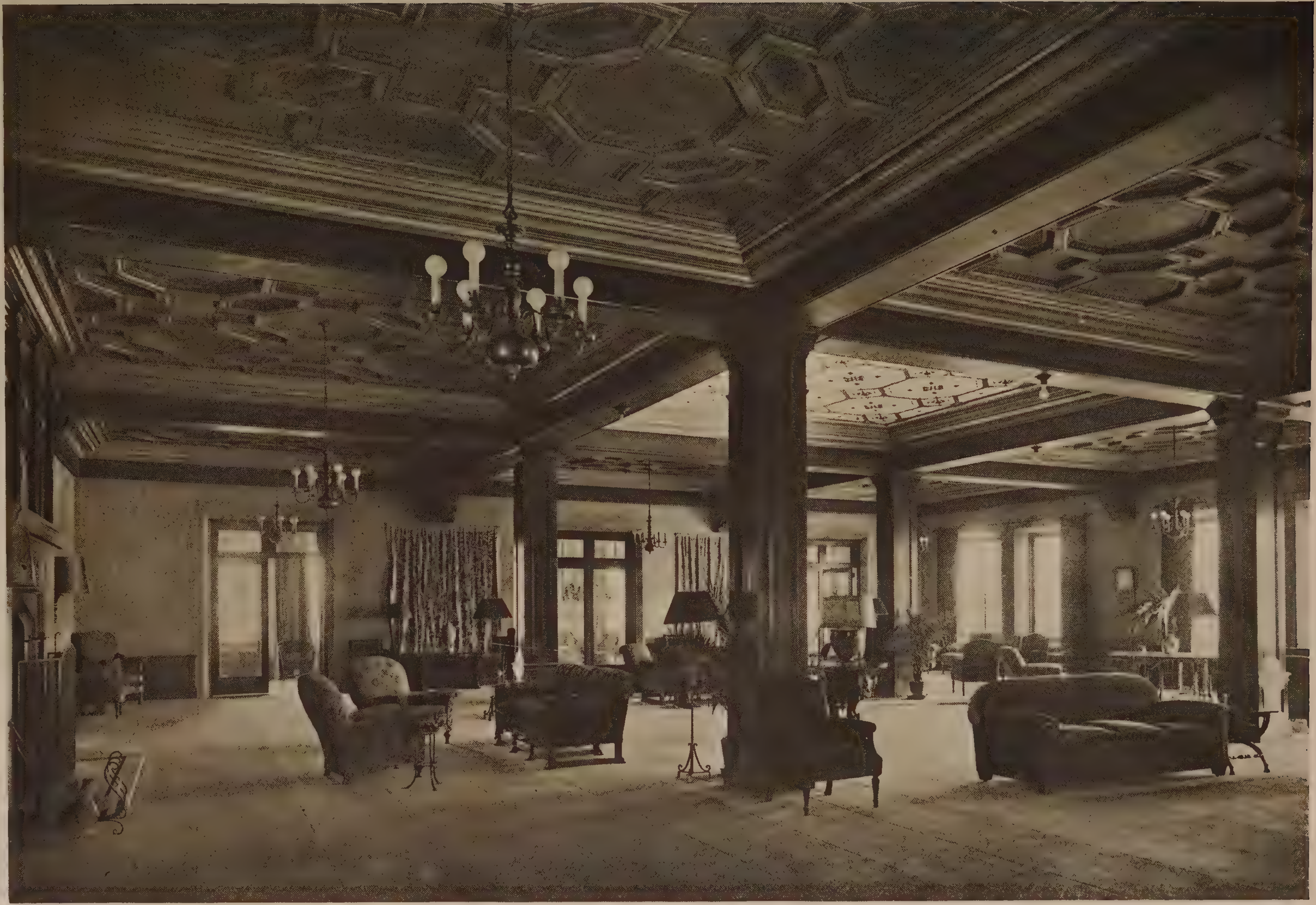


LAKE SHORE DRIVE ENTRANCE, AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

The main entrance to the Exposition Palace is on the east, or Lake Shore Drive, front, through Whiting Hall. This is a most imposing room of truly majestic proportions. Its length is 120 feet and its width 55 feet, while its height is about 35 feet.

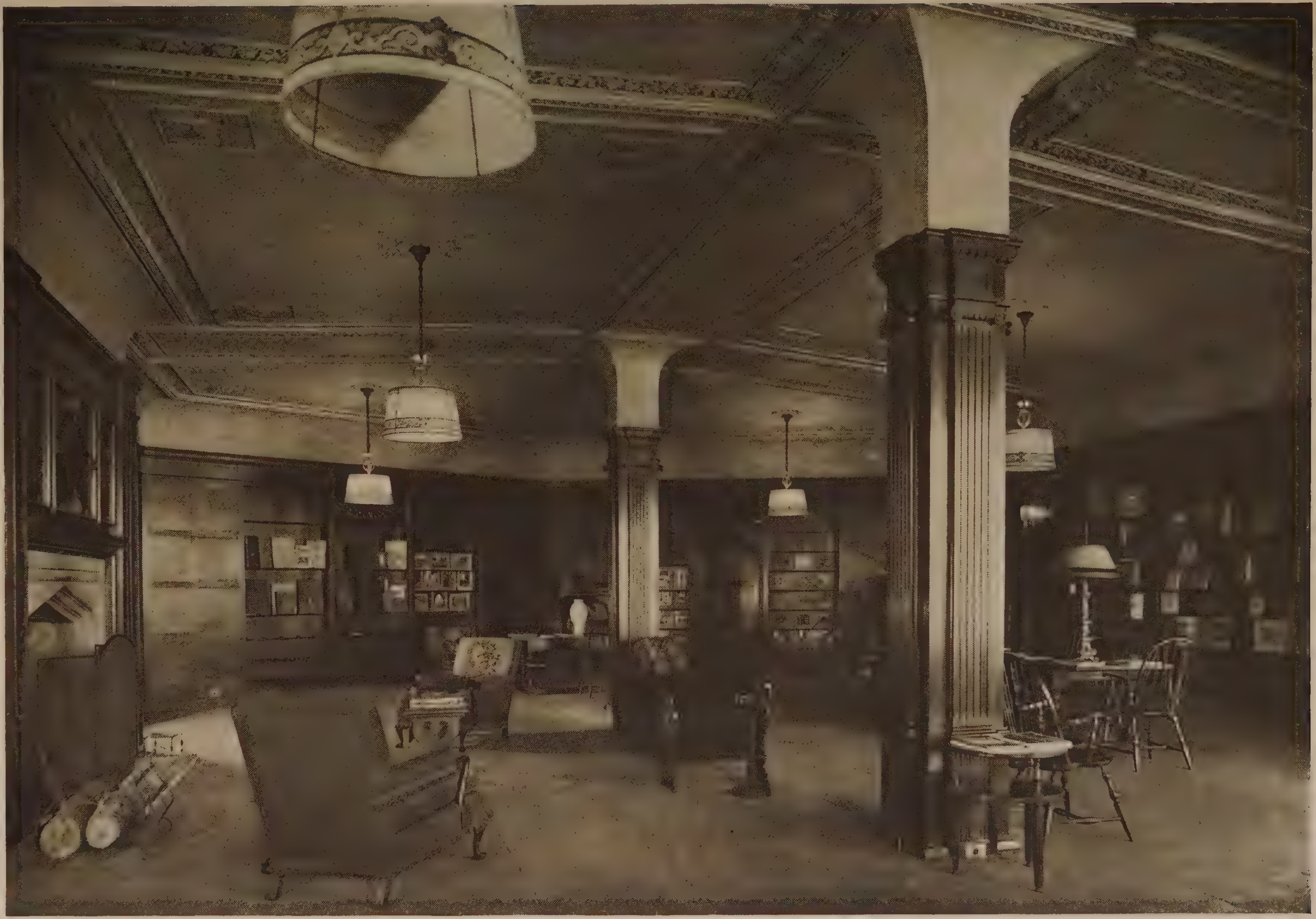
This entrance, named after Lawrence H. Whiting, the man who made this great building possible, is designed after the style of the English baronial hall. Its floor is of marble, its walls of Caen stone, and its ceiling of cast plaster highly decorated in color.



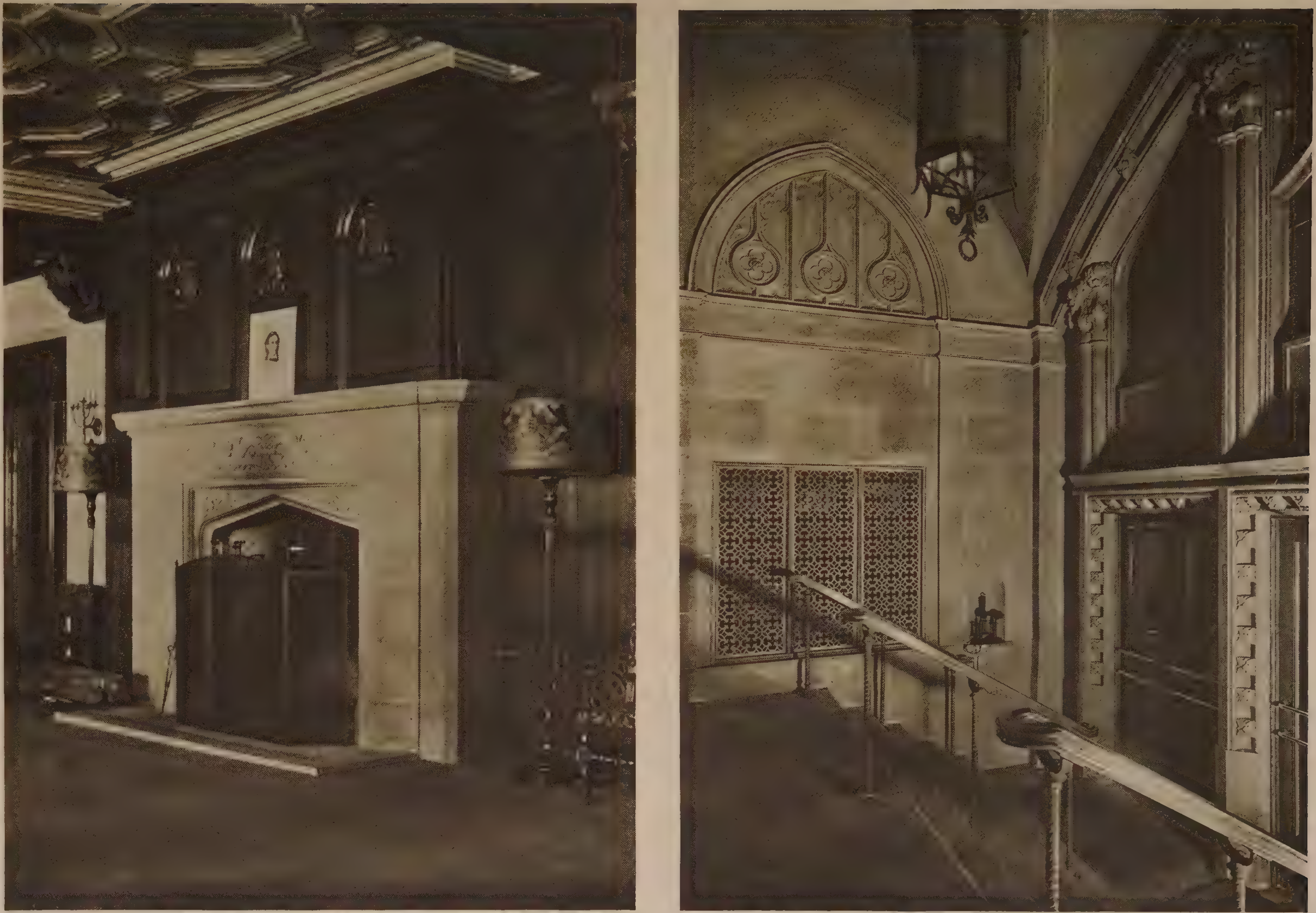
CLUB LOUNGE.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

AMERICAN FURNITURE MART BUILDING, CHICAGO.



CLUB LIBRARY, AMERICAN FURNITURE MART BUILDING, CHICAGO. Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

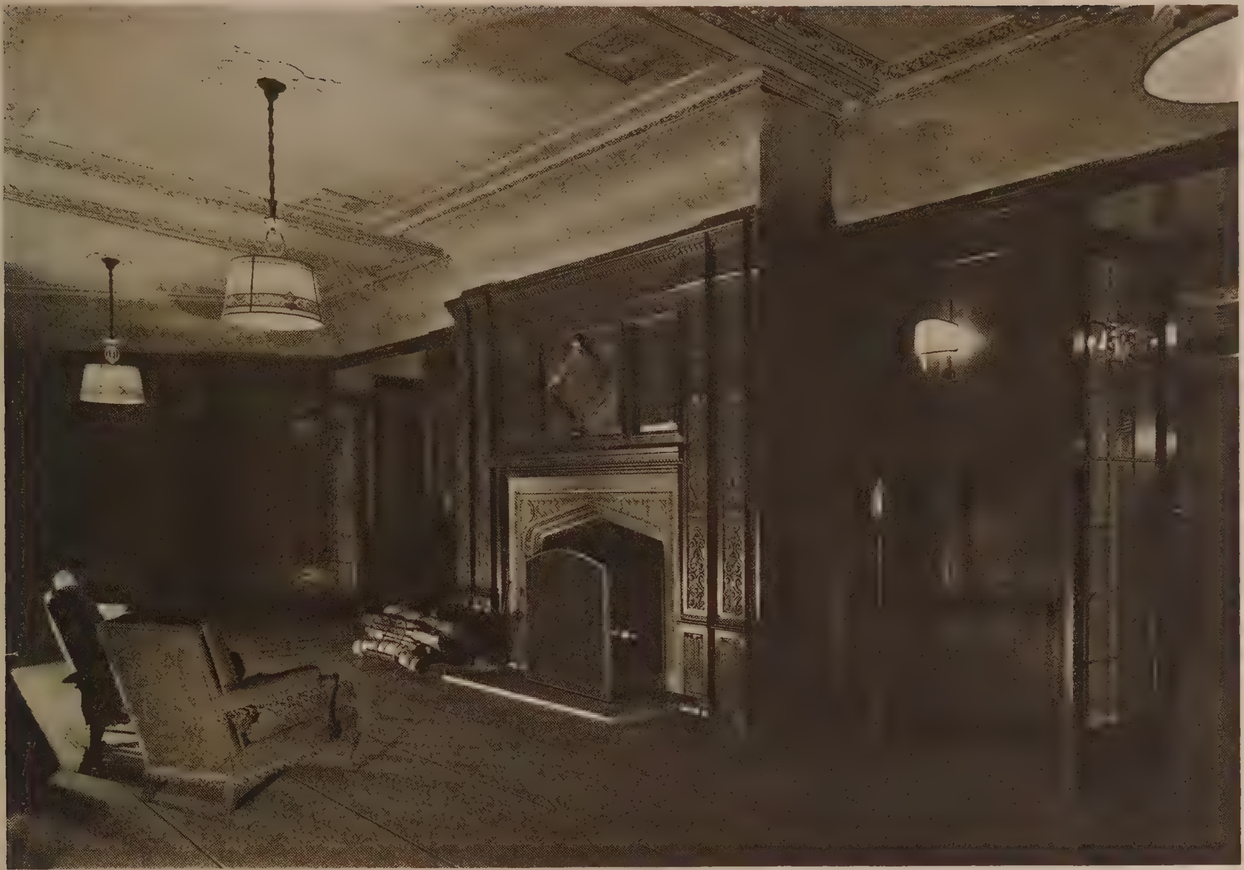


MANTEL IN CLUB LOUNGE.

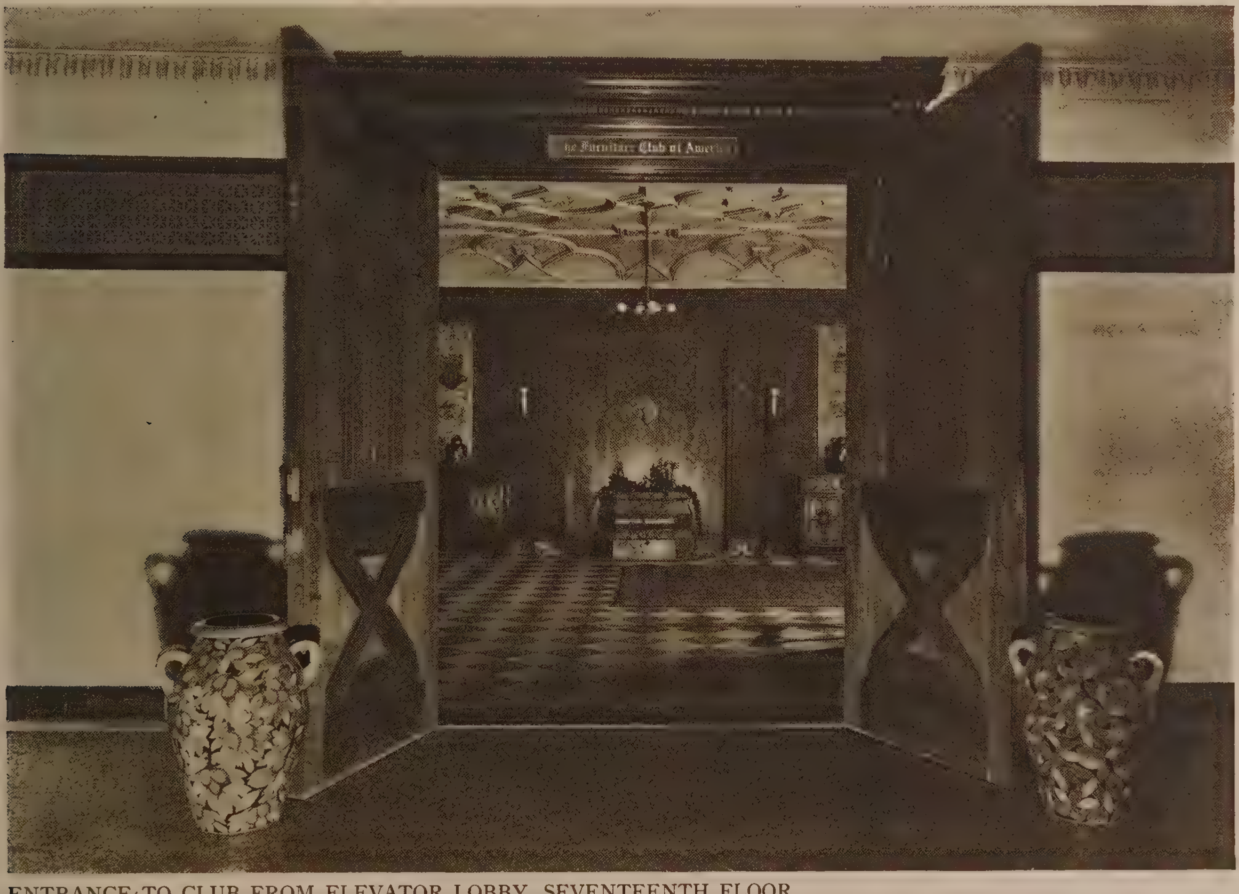
ERIE STREET ENTRANCE.

AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.



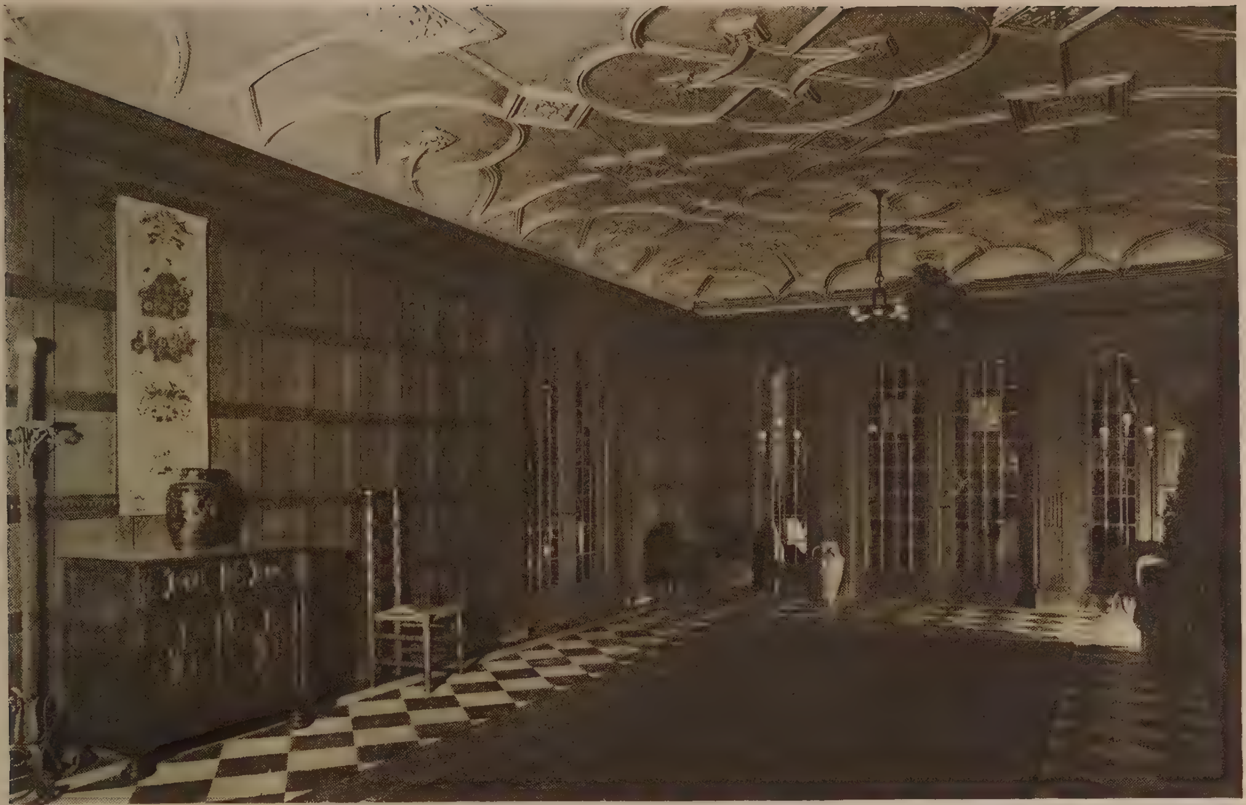
FIREPLACE IN CLUB LIBRARY.



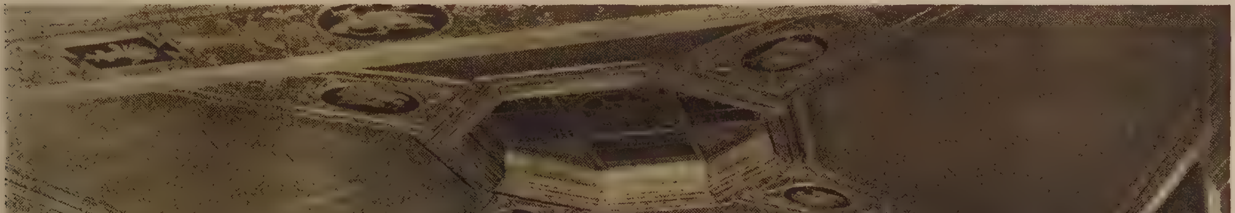
ENTRANCE TO CLUB FROM ELEVATOR LOBBY, SEVENTEENTH FLOOR.

AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.



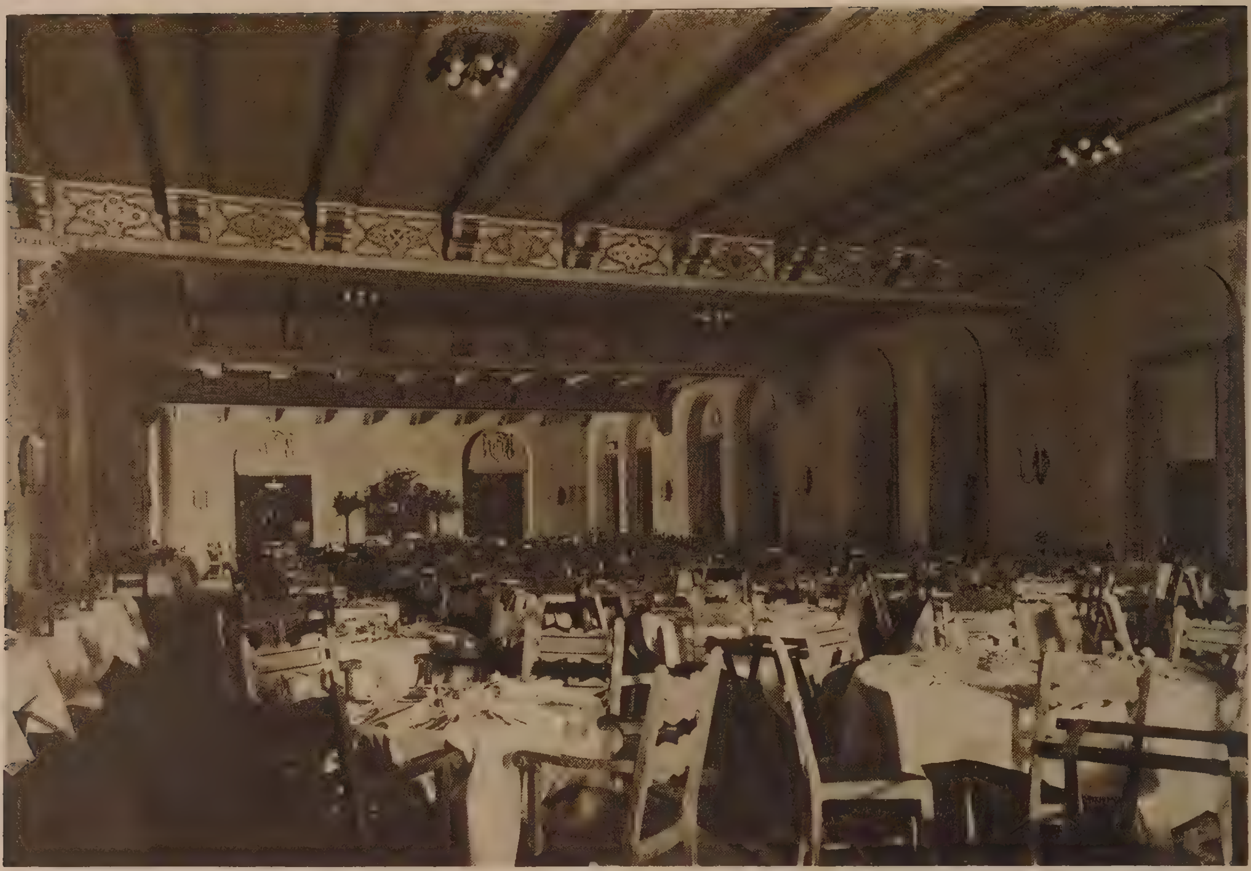
END OF LONG GALLERY



EXTENSION OF LONG GALLERY, THE CLUB.

AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.



CLUB DINING–ROOM.

CLUB LOGGIA. Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

AMERICAN FURNITURE MART BUILDING, CHICAGO.

The Furniture Mart Building, Chicago

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects

THE Furniture Mart Building is located on one of the finest pieces of property in one of the most rapidly developing localities in the world. Facing Lake Michigan and the Lake Shore Drive and bounded by three other principal streets, its size and prominence call for an architectural treatment beyond the ordinary.

It is said to be the largest building in the world, and because of the important function it performs in the furniture industry, it becomes more than a large building and approaches the dignity of an institution which is destined to wield an ever-increasing influence on the design, manufacture, and merchandising of furniture.

Mr. Henry Raeder, the architect, realized the responsibility that rested with him in designing a building that would measure up to the full significance of the purpose for which this building was intended, and he inspired the two architectural associates whom he asked to collaborate with him—Mr. N. Max Dunning and George C. Nimmons & Co. — with the same enthusiasm.

An interesting architectural problem was encountered in providing safe and easy ingress and egress for the great number of people who will visit the Exposition Palace without any interference with, or loss of control over, the tenants, employees, or buyers who would use the upper or furniture exhibition floors of the building.

This problem was met by locating the entrance to the furniture exhibition spaces on Erie Street, and the entrances to the American Exposition Palace on the Lake Shore Drive and on Huron Street.

The Erie Street entrance is handled in the English Renaissance style with groined vaults and decorated ceiling. The floors are of marble and the walls of Caen stone. The six high-speed passenger-elevators are banked on each side of this entrance, and a wide passage leads directly to the two combination elevators—spoken of before—which are designed to relieve the passenger load during peak hours.

Opening off the Erie Street entrance are the general offices of the building, a large check-room, information desk, mail-room, telegraph office, public telephone booths, cigar-counter, switchboard-room, and adequate rest-rooms and toilet-rooms for both men and women.

Wide doors are provided at the north end of the Erie Street entrance so that, should occasion demand, this entrance can be opened up into the Exposition Palace.

A wide mezzanine extending around three sides of the hall lends architectural interest and affords a monumental approach to the rentable areas on the second floor.

The stairs leading from the main hall to the mezzanine are of marble, liberal in width, and have a heavy perforated carved-oak hand-rail. The mezzanine rail is embellished with great oak panels richly carved. It may be well to mention here that an attempt has been made to encourage fine craftsmanship throughout the building and to avoid anything that is faked or meretricious. All carving is from the solid wood, and no "planted on" or compo ornament is used.

The building is bisected east and west by a very wide corridor with floor and base of terrazzo. The show spaces on each side of this corridor are 100 feet deep, and the smallest space is 20 feet wide, this being the typical column spacing.

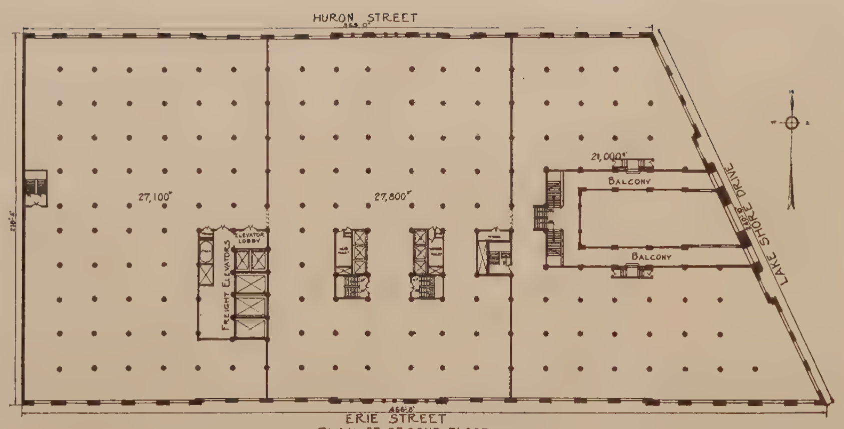
The Furniture Club of America occupies the south half of the seventeenth floor. The club was constructed under Mr. Dunning's personal supervision, and the furnishing and decorating were done by Mr. Dunning in collaboration with Ann Wilmot Dunning (Mrs. Dunning).

At the west end of the seventeenth floor, however, is the Scotch grill, a cafeteria and restaurant open to the tenants of the building and the public. This grill has a seating capacity of 600 people at one sitting, and is served by a completely equipped kitchen of sufficient size and equipment to serve not only the Scotch grill but the club as well.

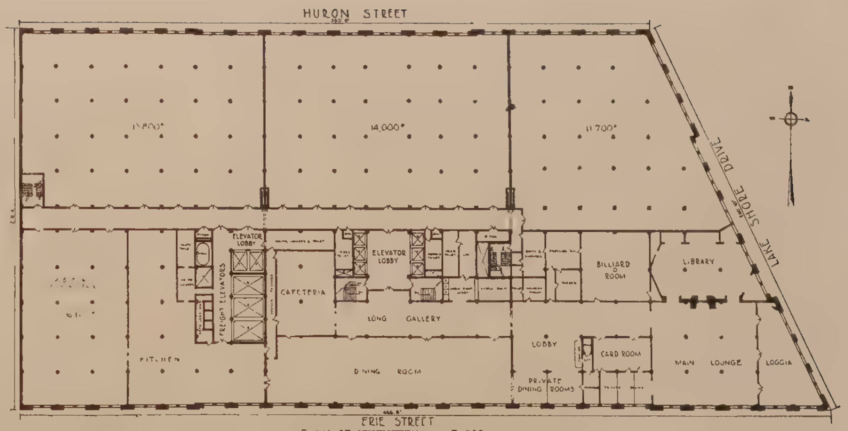
The walls of the grill-room are decorated with faithful reproductions of Scotch plaids representing five of the leading clans. The columns are decorated with a Scotch-thistle motif, and the lighting fixtures have the same motif worked on parchment. The floor is covered with linoleum simulating marble tile, and the chairs and tables are decorated in lacquers harmonizing with the walls.

The west end of the corridor approaching the Scotch grill is furnished with appropriate furniture to provide a lounging space.

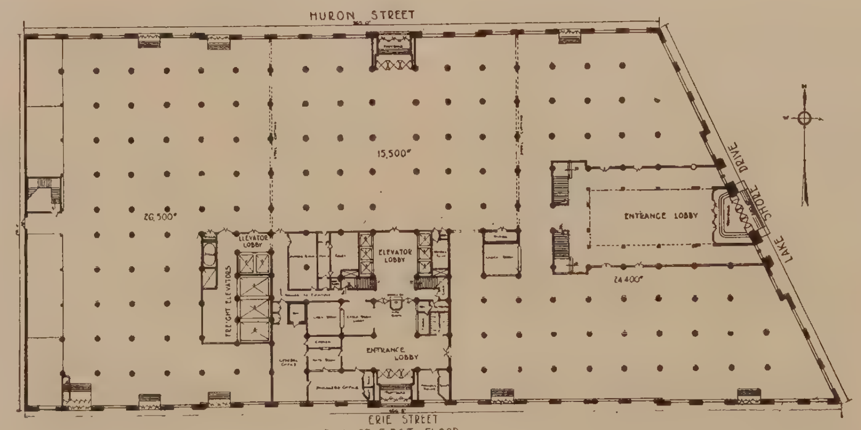
The exterior of the building is designed with the idea that it shall honestly express its purpose. A satisfying architectural effect has been sought by a careful consideration of the great masses and the use of materials that will give a pleasing color effect, rather than by excessive elaboration.



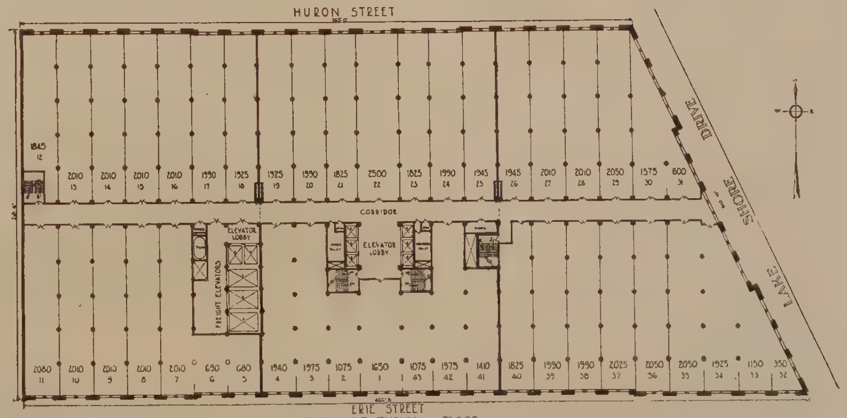
PLAN OF SECOND FLOOR



PLAN OF SEVENTEENTH FLOOR



PLAN OF FIRST FLOOR



PLAN OF TYPICAL FLOOR

AMERICAN FURNITURE MART BUILDING, CHICAGO.

Henry Raeder, Architect; N. Max Dunning and George C. Nimmons & Co., Associate Architects.

The gigantic size and the fact that no other similar building, at least in size, had ever been built, made it necessary for the architects to make original investigations and computations of many fundamental building problems—and problems bearing on the receiving, handling, and distribution of the vast quantities of furniture that must be handled without confusion, loss, or damage within comparatively short periods of time.

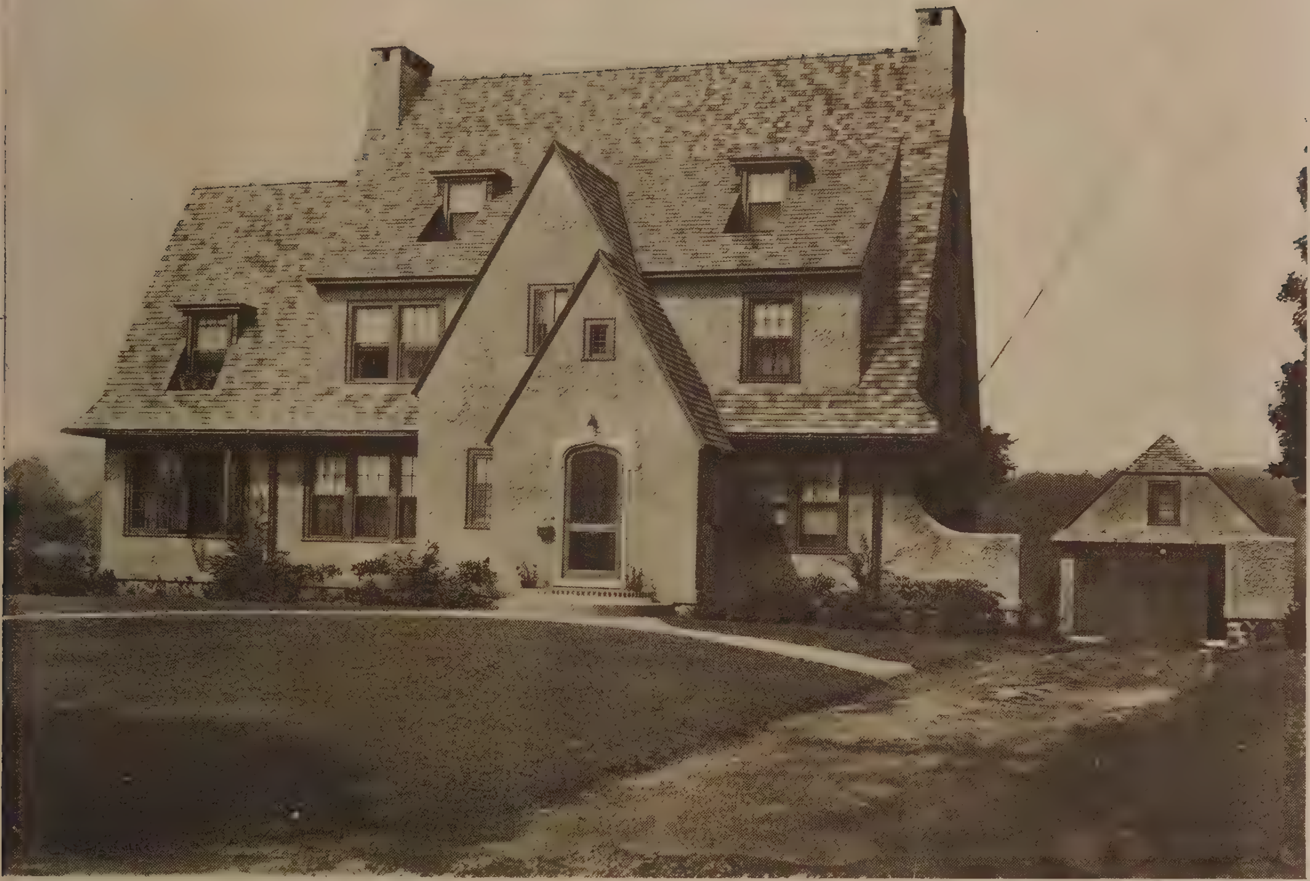
The Furniture Mart Building is of reinforced concrete, sixteen stories and basement high, and occupies an area of 220 feet by 466 feet.

Its main penthouse, which houses the passenger-elevator machinery, the house tanks, and the sprinkler tanks, rises 70 feet above the roof, making what is probably the highest structure of reinforced concrete ever built.

The foundations rest on piles which are driven in massive clusters from 50 to 60 feet below the level of Lake Michigan.

The first floor of the building is occupied by the American Exposition Palace, and is most impressive because of its great area and ceiling height, and because of the long lines of sturdy columns that support the building above.

The fire-prevention equipment in the building is complete, the steam heating service is the Vapor Heating System.



House, Wm. T. Cohalan, New Britain, Conn. A. Raymond Ellis, Architect.

The Successful House

By A. Raymond Ellis, Architect

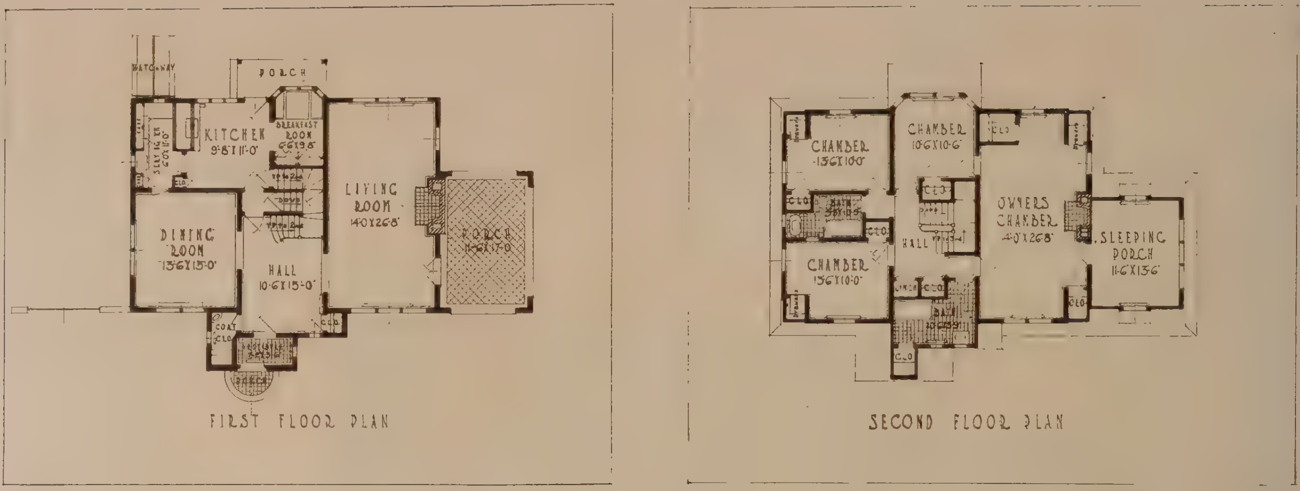
THE building of a house is a very simple matter, if ordinary care is used in the selection of a site and in the designing and planning of the house to suit the site, and in the selection of an appropriate style, executed in materials that are not only suitable, but permanent. There follows, in sequence, the selection of the proper equipment, and harmonious furnishing and decorating.

The home-builder, if it is his first venture, in order to select and organize successfully all of these matters, should have the assistance of an architect experienced in this particular work. There are very few who are willing to undertake the expenditure of even a small amount of money in any other venture without first obtaining the advice of a lawyer, or a good business man, as the case may be, but strange to say there are many who are willing to undertake the building of a home without properly safeguarding the investment, hoping to save a portion of the architect's fee.

The success of any house depends, first, upon having complete and properly drawn plans and specifications which form the basis of the contract. Second, the workmen must have a complete plan from which they can work, if the work of construction is to be promptly and efficiently carried on, for the lack of complete details causes errors and delays the work. These delays are expensive and annoying, amounting in small items to more than was saved on the architect's fee.

The small suburban home is really representative of the typical American house. The requirements are about the same, and though each plan and design may be apparently different, each seems to have its own charm and individuality. In most cases, these houses are the homes of people of taste and refinement in comfortable circumstances, and even people of wealth.

The cost of a house varies with the type of construction and quality of interior finish and equipment. A house may be as cheaply built as possible, cost being the first considera-



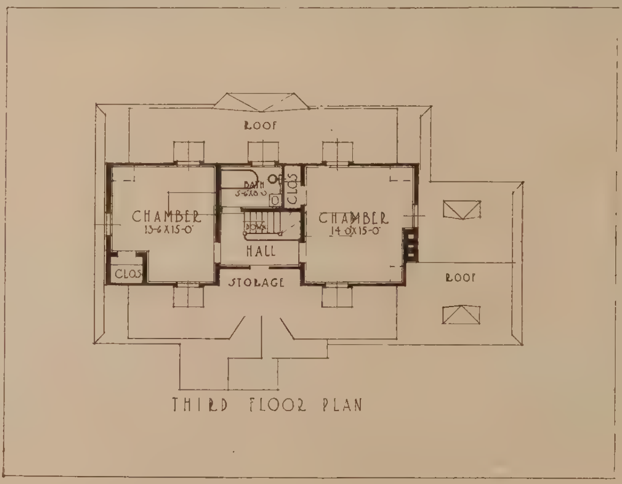
Reverse plans

tion; or, it may be well built and not expensively finished. The difference between the cheaply built house and the well-built house will probably amount to 25 per cent.

The house pictured here combines many features of the modern English style, with a type of construction successfully used in nearly all sections of the United States, and demonstrates that a small house can be fully as attractive as a larger and more expensive one, when carefully designed and planned. It is constructed of framework with the exterior walls finished in rough stucco on metal lath, forming a pleasing contrast with the shrubs and trees and a splendid background for the play of lights and shadows cast by the overhanging eaves.

The house has a cellar 7 feet 6 inches high; the first floor is 8 feet 6 inches high, which is sufficient to give the rooms good proportions; the second floor is 8 feet 6 inches and the attic 7 feet 6 inches high. Above the attic there is a sufficient air space to provide these rooms with proper ventilation, and as there are dormers on both sides of the roof, these rooms are well ventilated.

The entrance to the house is through a tile-paved vestibule into a well-proportioned hall, having an attractive staircase with panelled gallery boards, turned balusters, ramped rail and turned newel post. At the right of the hall is the dining-room and at the left is the living-room, with the walls of both finished in rough plaster, painted in an antique ivory finish with simple woodwork finished in a darker shade of ivory. The living-room has a large stone fireplace.



Reverse plan

An examination of the plan will show that it is carefully arranged to provide ample furniture positions. From the living-room, French doors open into a sun-parlor. In the angle formed by the projection of the sun-parlor and the living-room, there is a small paved terrace which answers as an out-of-door porch.

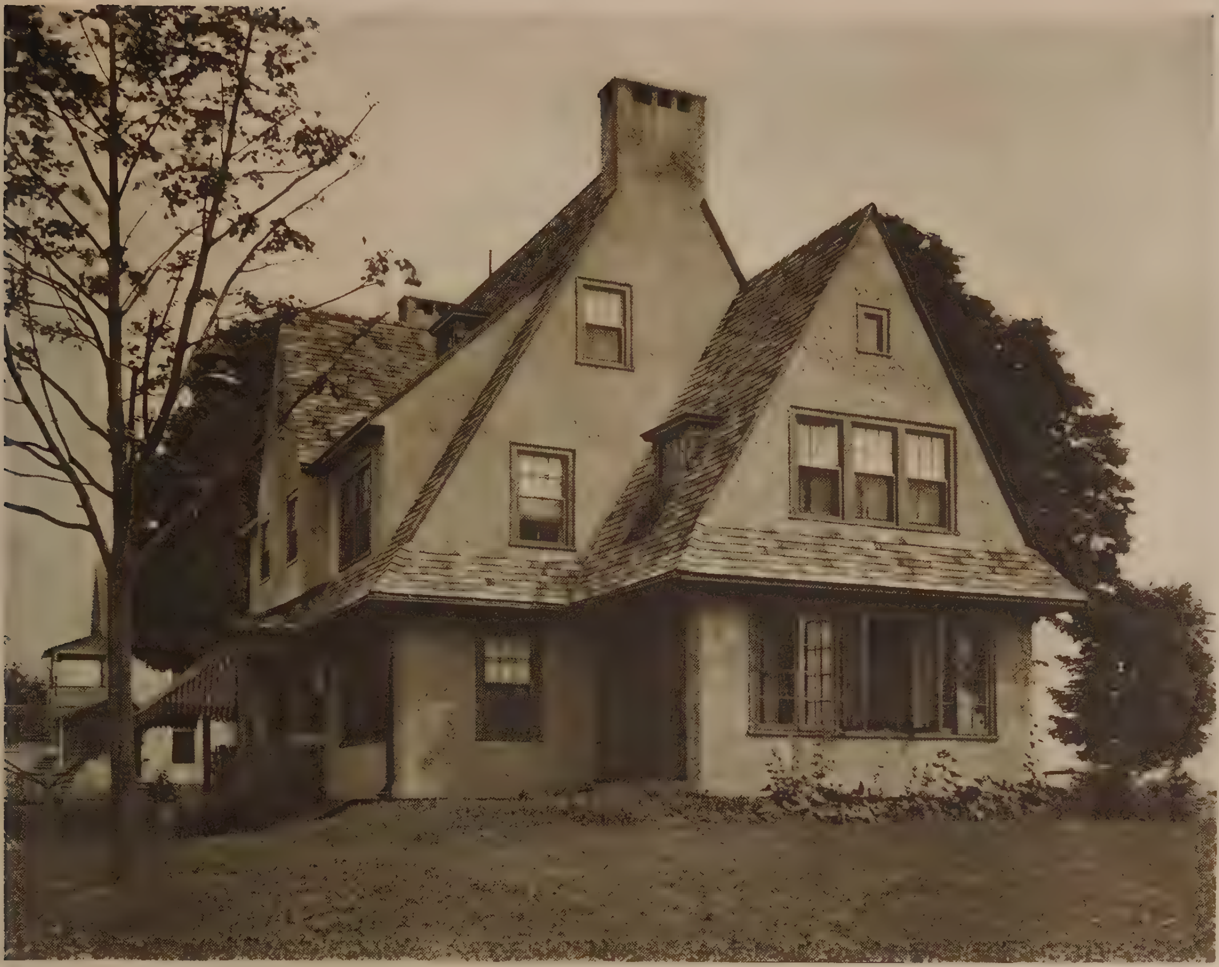
The kitchen is reached through the rear of the front hall, or through the serving-room, but in either case there are two doors between the kitchen and the main house, thus obtaining a certain amount of isolation which is necessary to prevent cooking odors and the clatter of dishes from pervading the main portion of the house. The serving-room is arranged with the glazed cupboards in the wall which divides it from the kitchen. These cupboards open from both sides, facilitating greatly the handling of dishes from either side. Off the kitchen is an alcove which can be used as a breakfast-room or as a maid's sitting-room.

On the second floor there are four chambers, and two baths. The largest is used as the owner's room; from this is a sleeping-porch built over the sun porch. These chambers are painted and enamelled in light ivory. The walls are papered in plain papers and color is added by the use of attractive cretonnes.

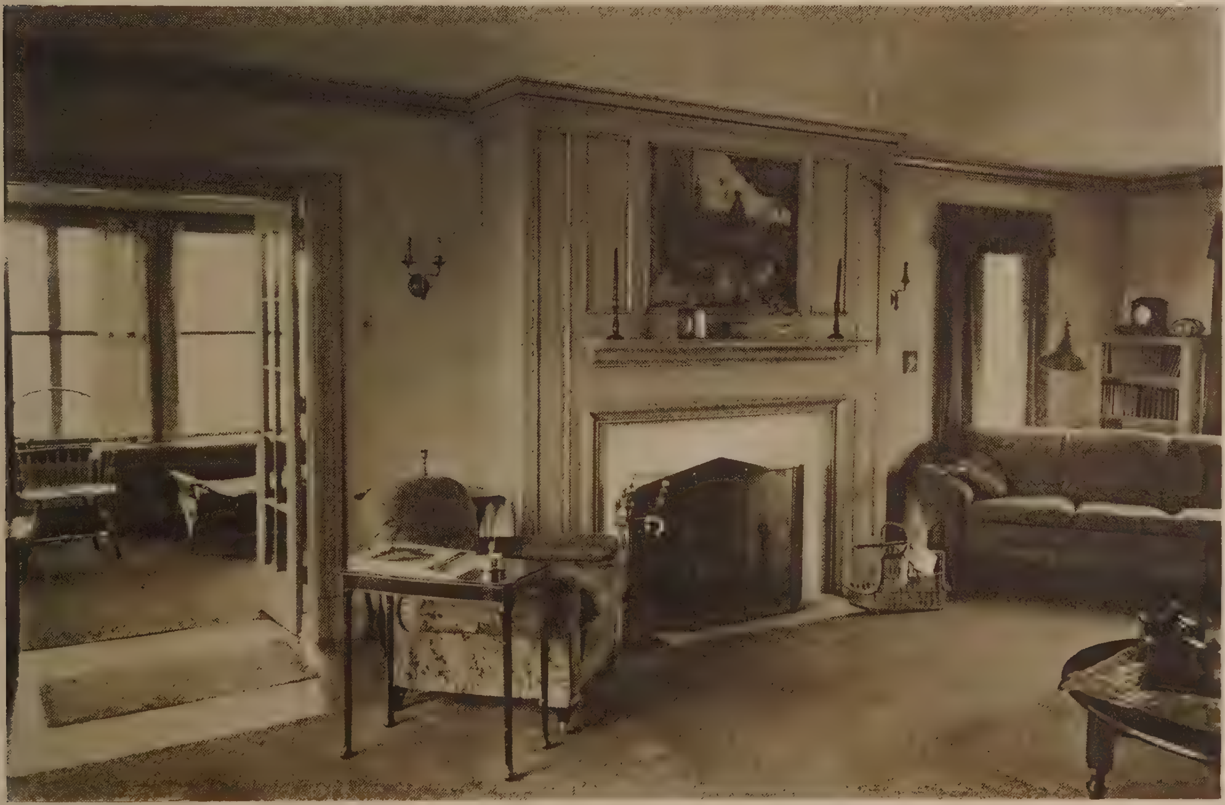
The attic contains two maids' rooms and a bath and ample closet space, as well as a storage attic.

The large chimneys extending through the gables at each end give them the appearance of stability.

Any successful building is the result of carrying out carefully prepared plans and details, the maintaining of right proportions of windows, wall spaces, and heights, and the proper combination of the various materials.



REAR OF HOUSE.



LIVING-ROOM.

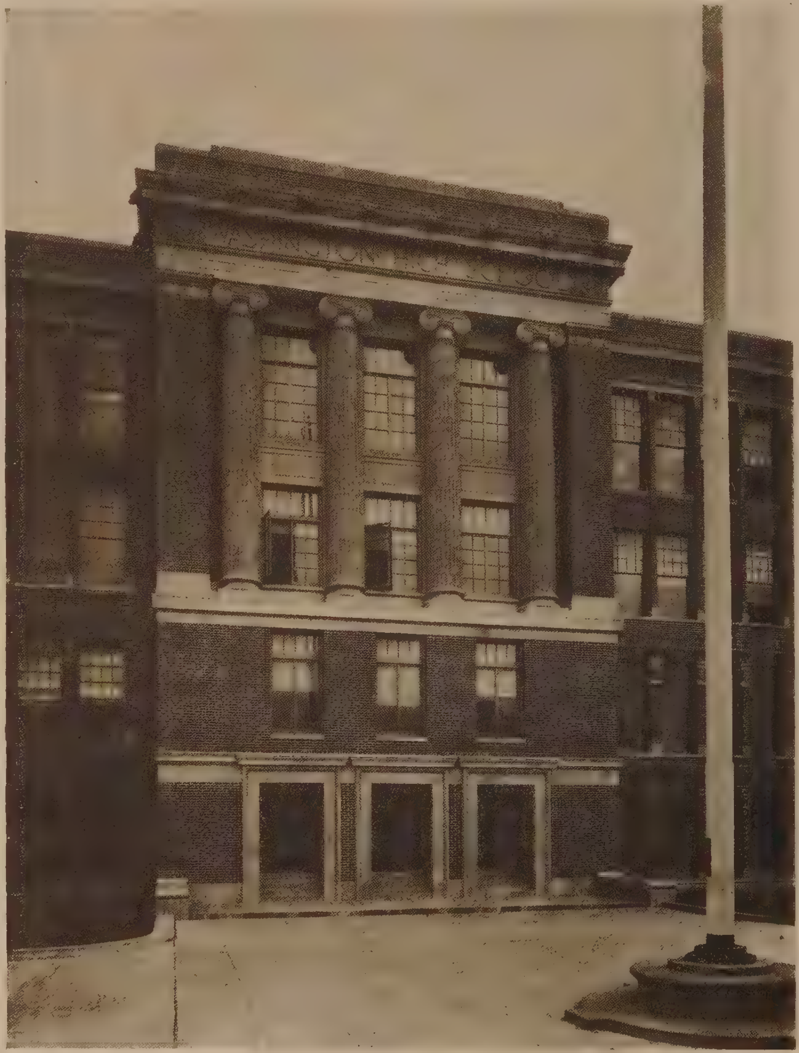
HOUSE, WM. T. COHALAN, NEW BRITAIN, CONN.

A. Raymond Ellis, Architect.

New Washington High School at Portland, Oregon

Houghtaling & Dougan, Architects

IN the designing of the new Washington High School, built to accommodate two thousand students and located on the block bounded by East Stark, Fourteenth, Alder, and Twelfth Streets, Portland, Oregon, Houghtaling & Dougan, architects, had the problem of using the old foundation of the original structure, previously destroyed by fire. According to the instructions of the school board, it was necessary to utilize this original foundation, so it was necessary to plan the new building in conformity with the main line of the old one, making the cost of the completed structure greater than if an entirely new foundation had been provided. Total Cost, $631,528.38.



Main entrance detail.

Classic design was chosen for the new building, which has outside dimensions of 178 by 160. The exterior surface is of select common red brick with mottled terra-cotta trim. The first floor has entrance on three sides, consisting of the main entrance on the west side, two entrances on the east, and one on the south side.

In the basement, which is practically all on the ground floor, a large cafeteria occupies centre space, surrounded by the fanroom, which accommodates a force fan ventilating and heating system, laboratories, manual training and domestic science departments, and a little model apartment, consisting of reception-room, kitchen, and dining-room. Both sets of toilets are also provided in the basement, and all corridors are lined with steel lockers built flush with the walls.

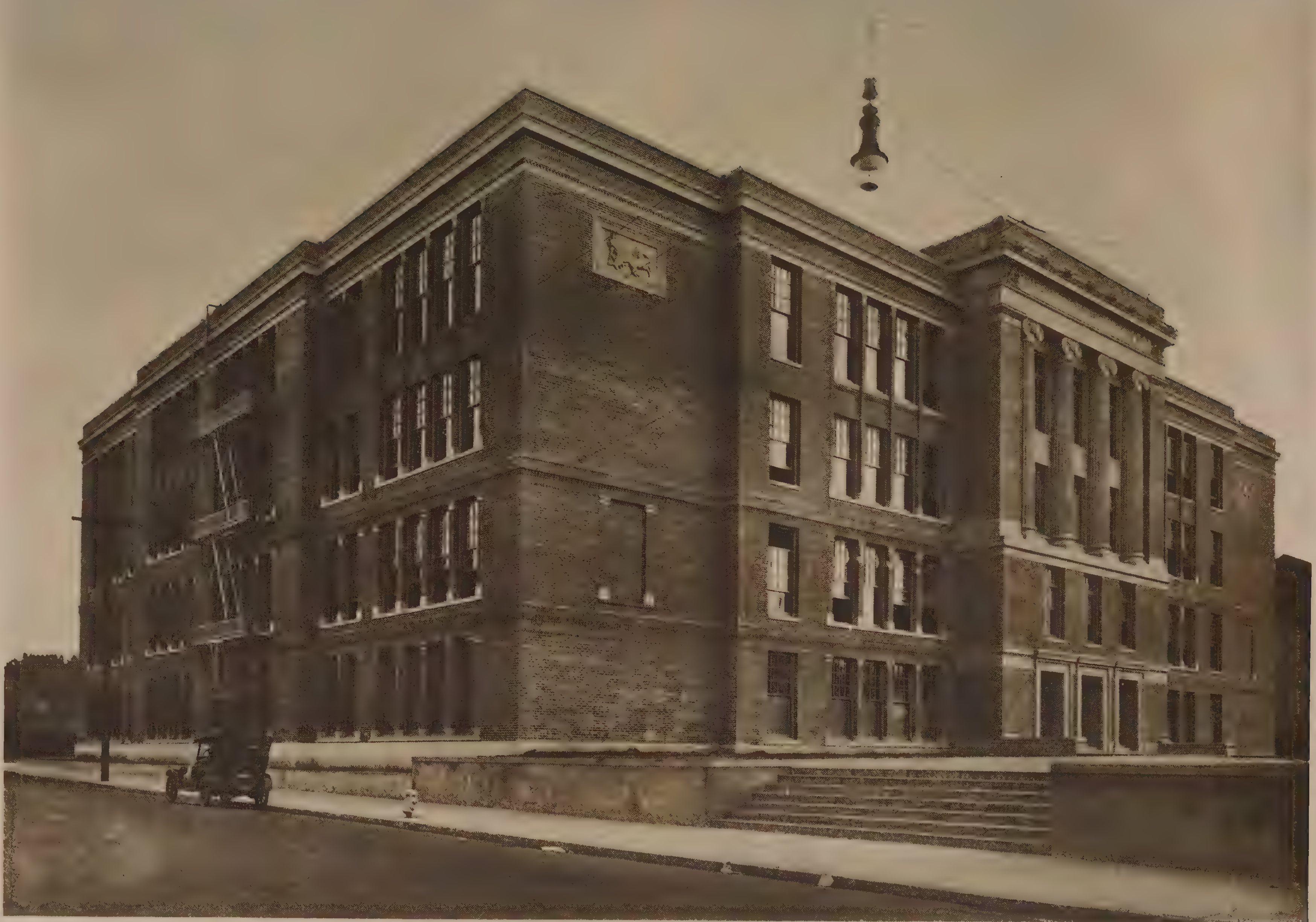
The first floor provides an auditorium, administrative offices, reception and rest rooms for both men and women teachers, general classrooms, two sets of toilets, and lockers, which, like all others in this building, are built flush with the walls. The auditorium is 64 by 65 with a stage measuring 45 by 21. Five exits from the auditorium all lead direct into the corridors, while two exits from the stage and one in each of the anterooms all likewise lead into the corridors. A moving-picture room is also provided here, where the total seating capacity is 860.

On the second floor are the auditorium balcony, an office for the various heads of departments, a library and library study-room, rest-rooms for the faculty, emergency and first-aid rooms, classrooms, publication-rooms, and toilets.

Science laboratories, and an industrial-art department, wherein a blueprint room with full printing-machine equipment is included, occupy the main part of the third floor, the rest being given to janitor's closet and toilets. Provision is also made for a radio-room.

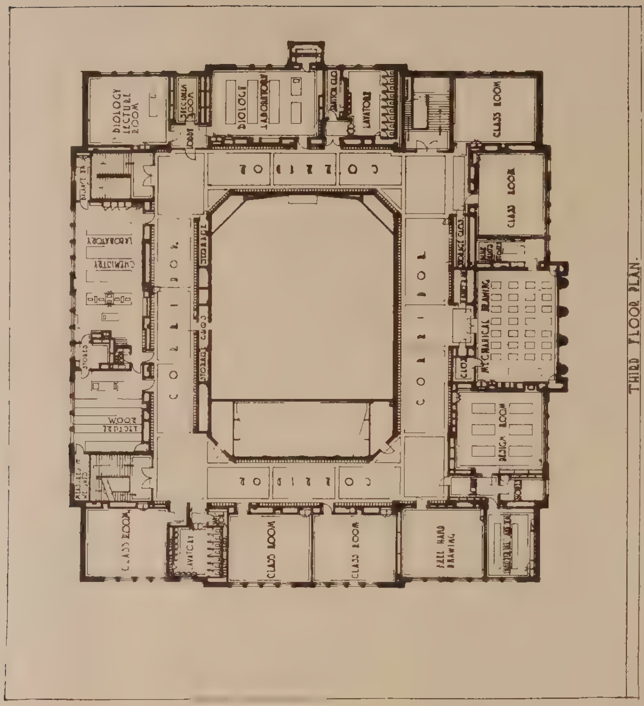
According to the local fire protection code, all stairways in this structure are enclosed in metal framework and wired glass. No gymnasium facilities were required in the new building, as the old gymnasium was located in a separate building which had not been reached by the fire.

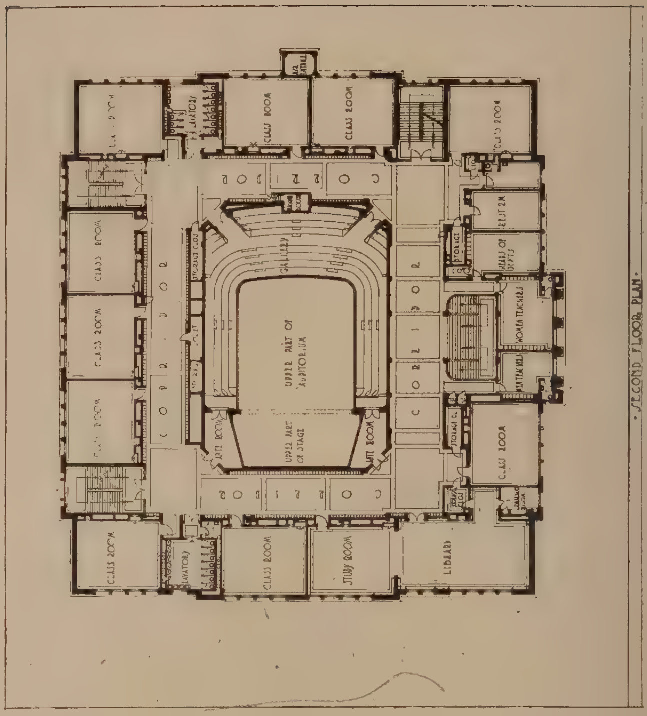
This building, newly completed, and occupied for the first time this fall, is considered an outstanding example of modern school buildings rising in the fast-growing Northwest.

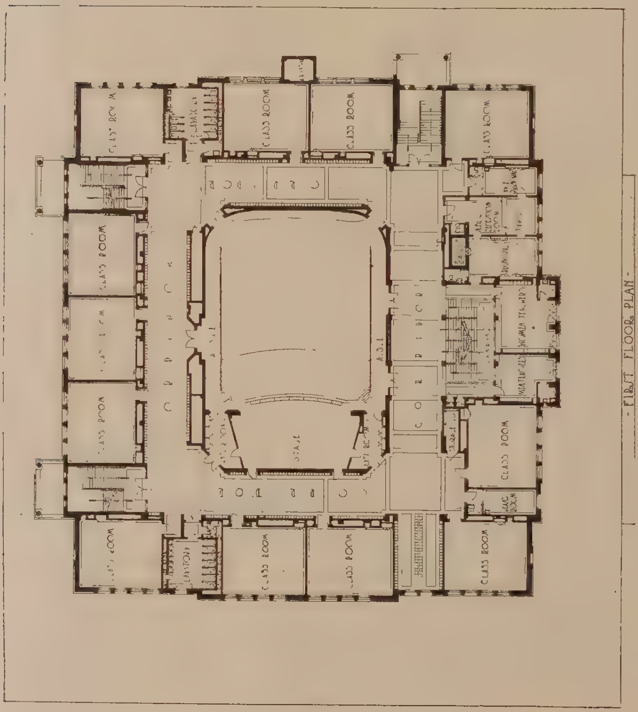


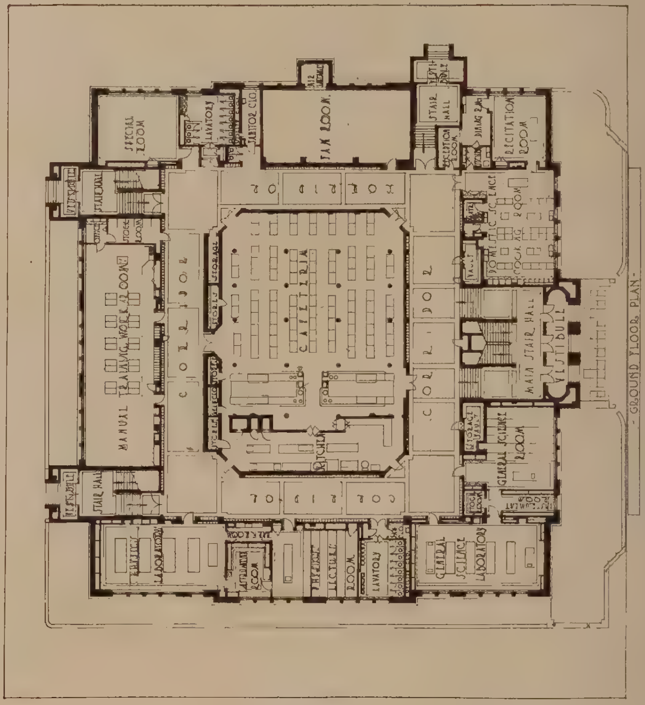
NEW WASHINGTON HIGH SCHOOL, PORTLAND, ORE.

Houghtaling & Dougan, Architects.



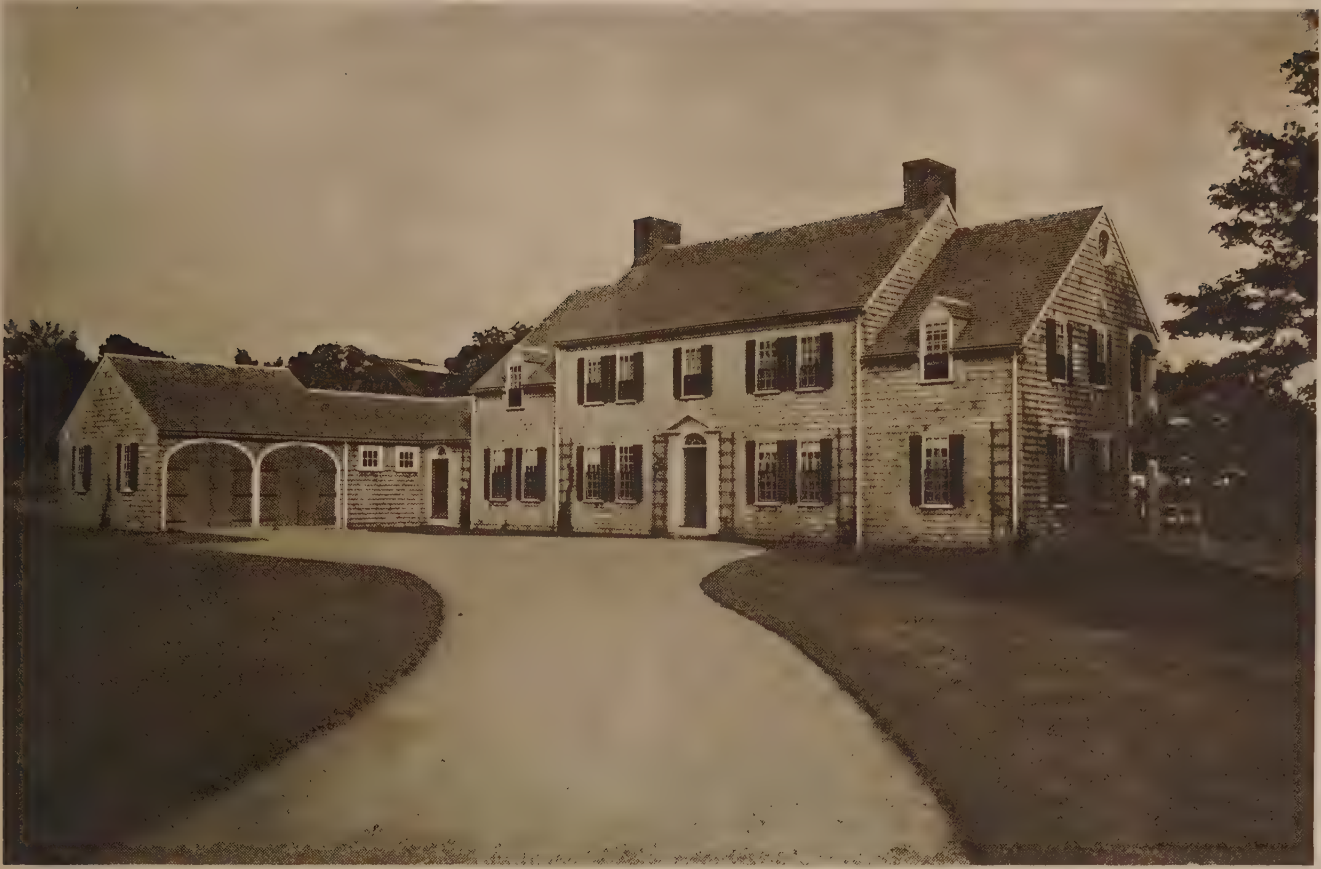


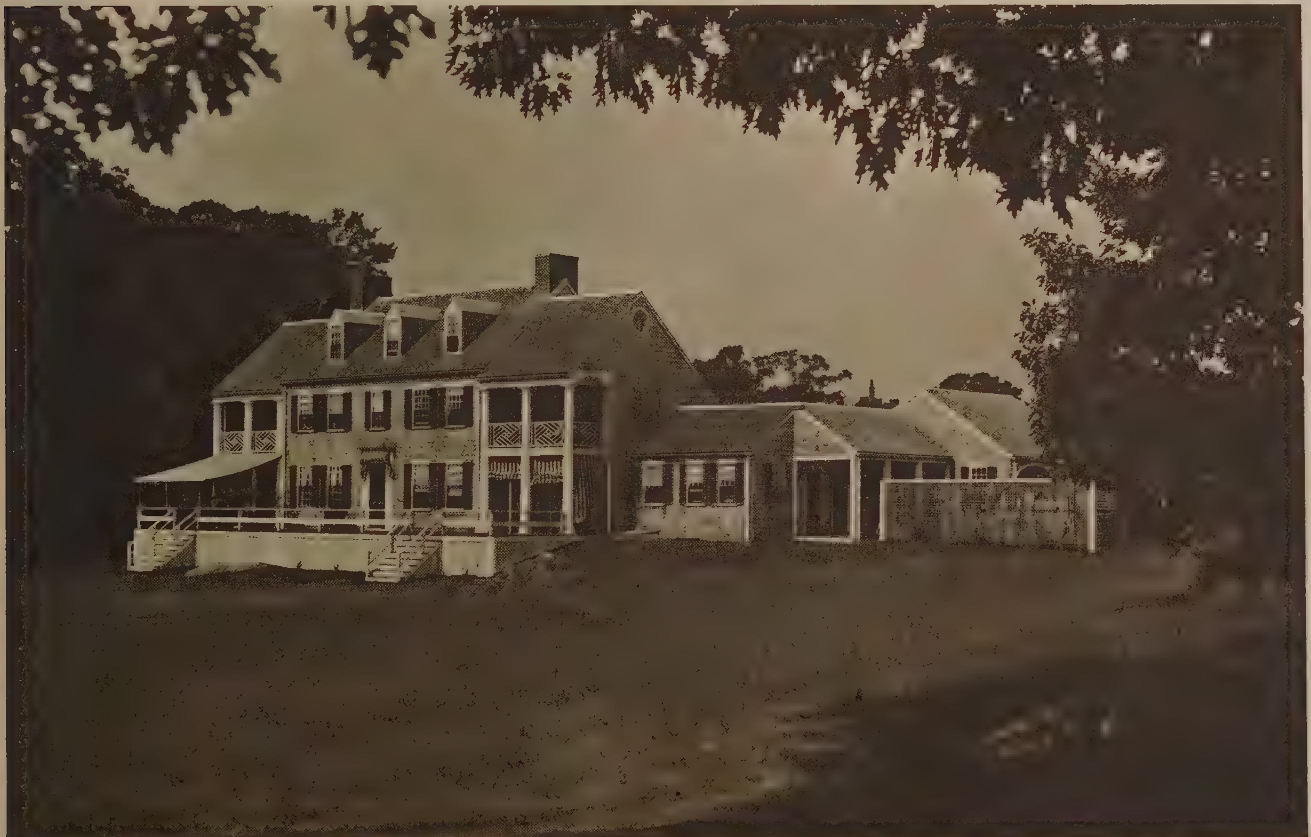




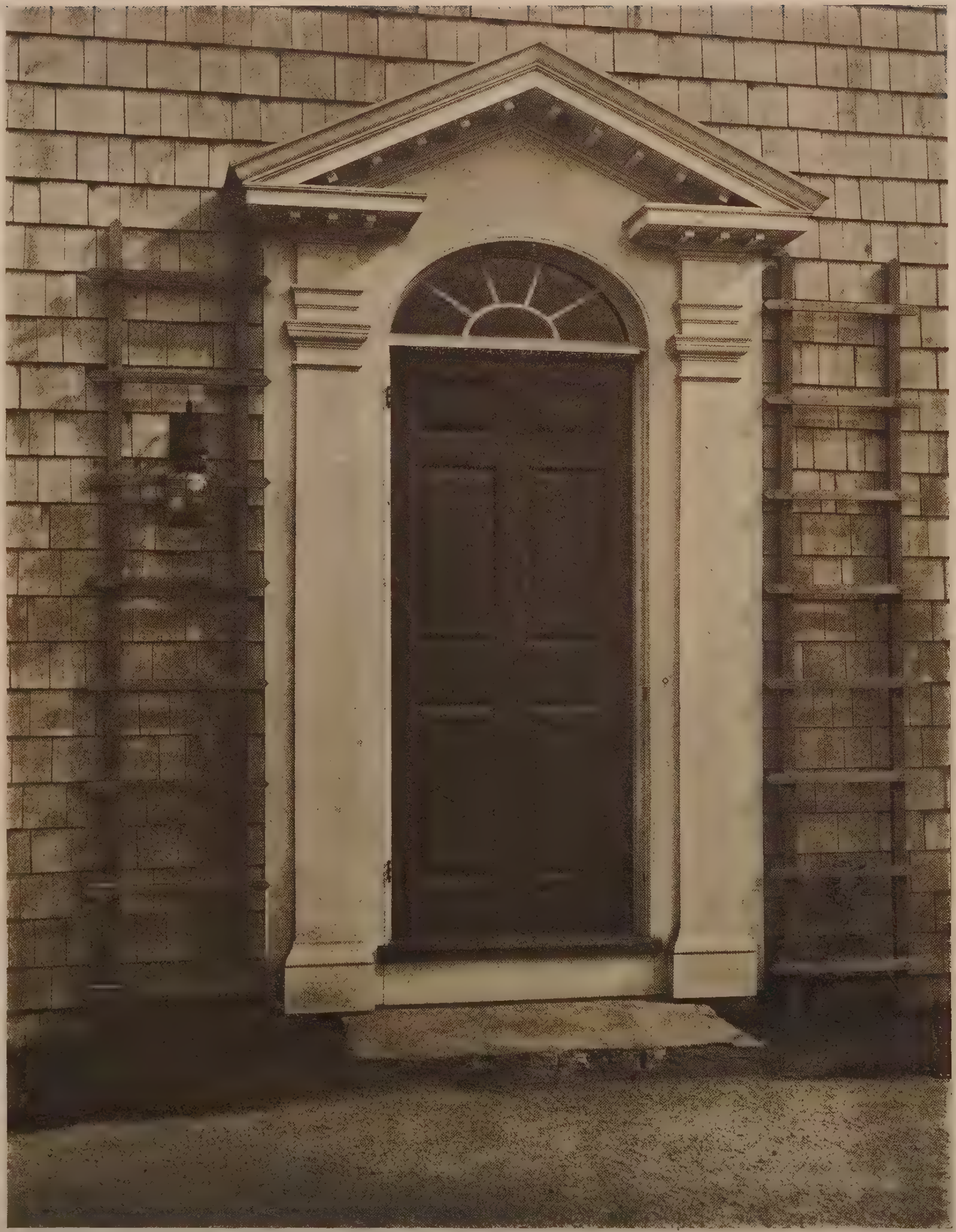
NEW WASHINGTON HIGH SCHOOL, PORTLAND, ORE.

Houghtaling & Dougan, Architects.

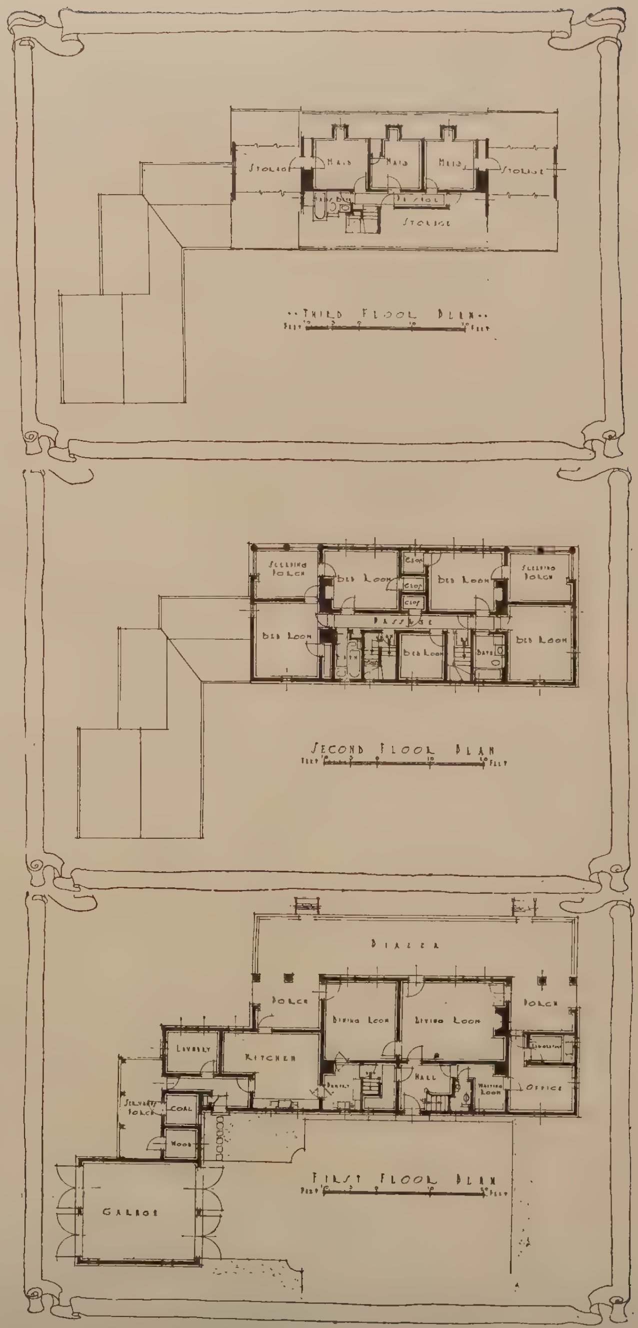




HOUSE AT MANCHESTER, MASS. Alexander F. Law, Henry R. Shepley, Associate Architects.



HOUSE AT MANCHESTER, MASS.



Alexander F. Law, Henry R. Shepley, Associate Architects.

Building for the National Casket Company, Inc.

138 East 57th Street, New York City

Clarence S. Stein, Architect

THE building of the National Casket Company offered unusual complications in the varied activities that were to be housed under a single roof. The architect was required not only to find place for the offices of the executive and bookkeeping departments of the central organization of the metropolitan district of this large corporation, but also for a series of showrooms of various sizes, funeral parlors, including a large chapel, a mortuary and embalming room, as well as dormitories and rest-rooms for certain of the employees. All these were to be placed in an old building located on an inside lot only 36 feet wide. The building, situated on 57th Street near Lexington Avenue, was originally used as a meeting-place of a large association, but had degenerated into a storage warehouse.

The functions of the building can be covered under two headings: those having to do with sale and those having to do with funeral services. It was essential that the two groups of clients be kept separate. For this purpose, two vestibules were arranged. From the eastern one the elevator connects with the top story, which is entirely devoted to funeral services. This service, as a branch of the work of manufacture, is quite new, and has resulted from the life of a big city, and particularly from the needs of transient visitors. These services, which were formerly held either in the home or church, are now more and more being held in the funeral parlors and undertaking establishments. Many of the undertakers, having small quarters, are glad of the opportunity to use the facilities offered by the manufacturer.

Two of the funeral parlors are proportioned and decorated so as to give a homelike appearance. The main funeral parlor, on the other hand, has the scale and dignity of a chapel. The effect of the colored pattern on the ceiling and around the main arch under which the casket is set, of the open wooden organ grille and the painted panels on the balcony front and the rough tan walls, is in no sense sombre.

The family room, which is separated from the chapel by two wooden screens, over which thin wire has been stretched, is arranged in such a manner that it is possible for those in this room to observe what is taking place in the chapel without being seen from the larger room. It is not necessary for the family to pass through the funeral parlor in leaving at the end of the services. A small stairway from the vestibule leads to a balcony to be used by the organist or by a choir.

Another funeral parlor is separated from the chapel by folding-doors in such a manner that it can be used either as part of this room or separately.

Another service which the company offers to the undertaker is that of embalming. A room for this purpose is situated in the well-lighted basement, and has the appearance of an operating-room of a hospital. As this branch of the service may be needed at any hour, a number of men live in the building, and have their dormitories and rest-rooms on the third floor.

The offices and salesroom are entered through the western vestibule. On the main floor are situated not only the main executive offices of the metropolitan district, but also the offices of the sales department. A special room is set aside on the third floor for meetings of the directors. The remainder of the space on both the second and third floors is devoted to a series of display-rooms of various sizes. The principal exhibition is in a great hall, 68 feet long and 20 feet 6 inches high. The decoration of the beamed ceiling is suggestive of the Greek or Egyptian in its decided color and pattern. One end of the hall is hung with a great drapery which completely closes out natural light. At the other end is a great dark-reddish marble doorway leading to a small room arranged as a mausoleum. In this are placed three of the finest bronze caskets. These are exquisitely designed and were executed by Gorham and John Polachek Bronze & Iron Company. The lighting, which comes from four candelabras, is entirely reflected from the ceiling. The mausoleum has been arranged with the idea of showing the architectural possibilities of leaving the casket exposed in a mausoleum instead of setting it behind panels of marble or slate, as is customary. The floor is marble, and the walls are in an imitation granite.

Announcements

Lorentz Schmidt, C. F. Boucher, and H. G. Overend announce the formation of the firm Schmidt, Boucher & Overend to continue the architectural practice carried on by them under the firm name of Lorentz Schmidt & Co., in the Fourth National Bank Building, Wichita, Kansas.

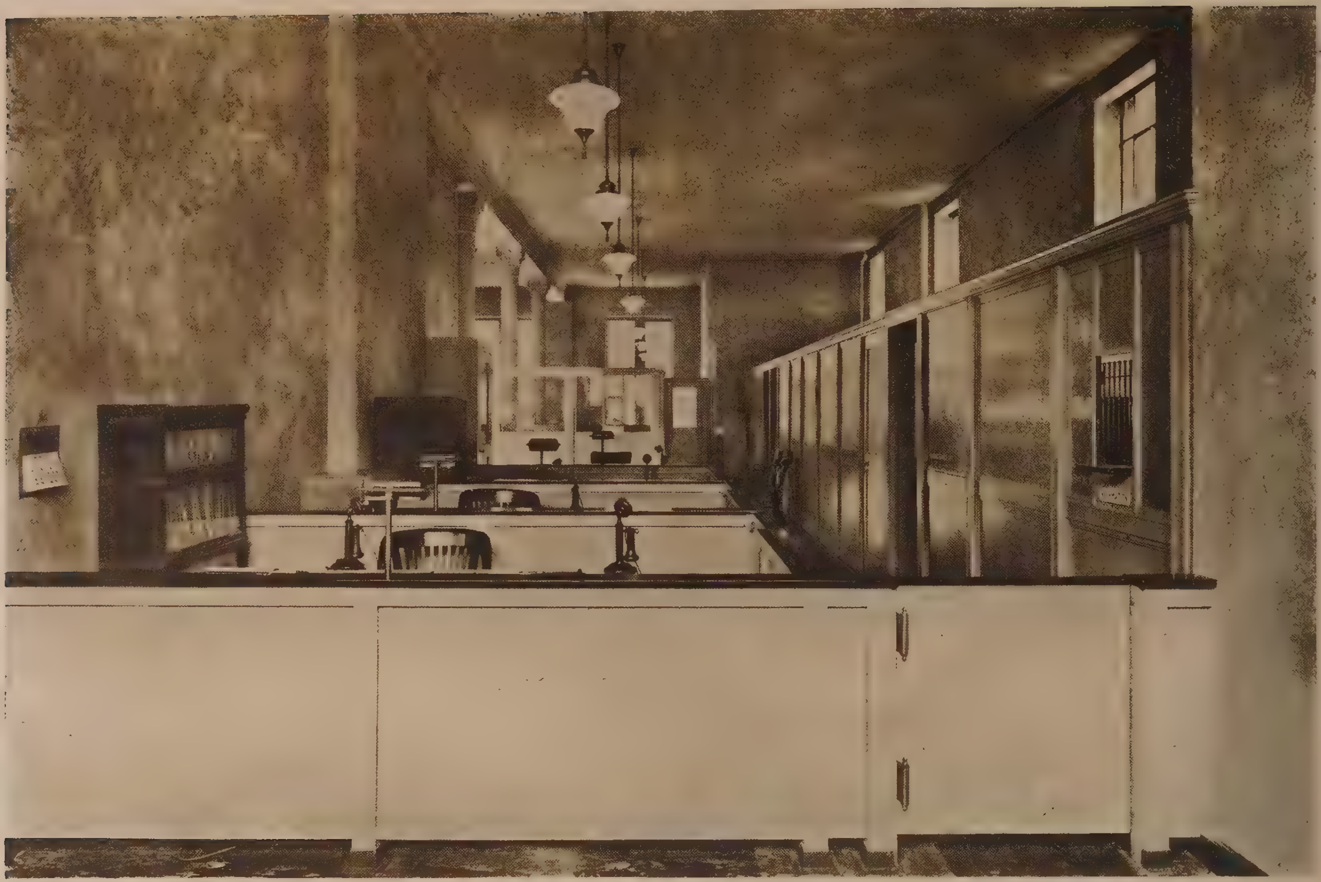
G. Glover Boake, real estate and builder, formerly at 2940 Markbreit Avenue, Public Square, Oakley, Cincinnati, Ohio, has taken new offices at 609 Gwynne Building, Sixth and Main Streets, Cincinnati.

Waters & Wilkes, architects, 43 Scott Street, Toronto, announce the removal of their offices to 96 Bloor Street, West, Toronto. The members of the firm are: Mackenzie Waters, B. A. Sc., F. Hilton Wilkes, B. Arch. A. R. I. B. A.

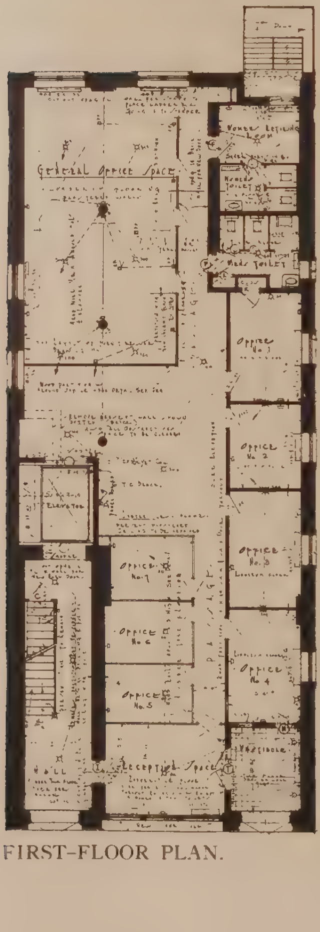
Announcement is made of the dissolution of the firm of Myers & Coffin, architects, of Indianapolis, Ind. Clarence T. Myers will continue in practice at the old address, 412 Pennway Building, Indianapolis. Kenneth D. Coffin has moved to 424 Board of Trade Building.

Proudfoot, Bird & Rawson, architects, announce that Clark Souers has entered the firm and hereafter the practice will be carried on under the firm name of Proudfoot, Rawson & Souers, architects, 810 Hubbell Building, Des Moines, Iowa.

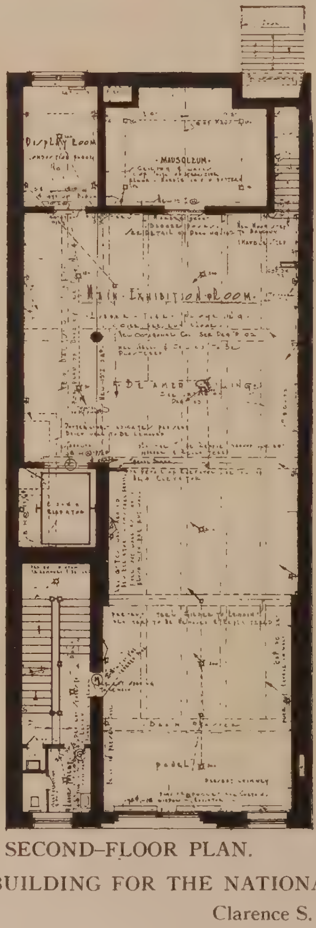
C. L. Phelps announces the removal of his office from 924 Detroit Savings Bank Building to 503–4 Detroit Savings Bank Building, Detroit, Mich.



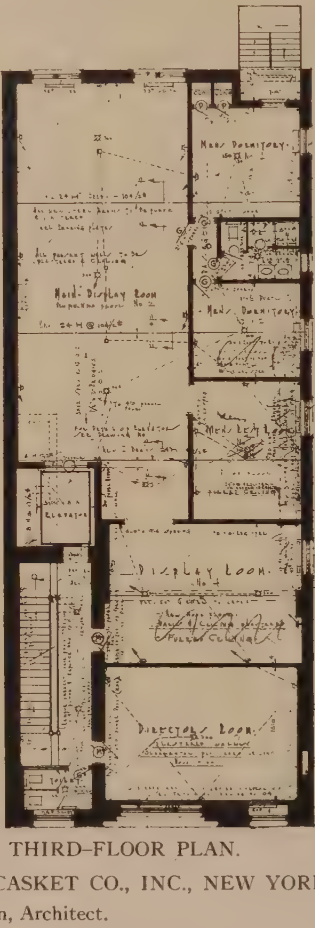
OFFICES, FIRST FLOOR.



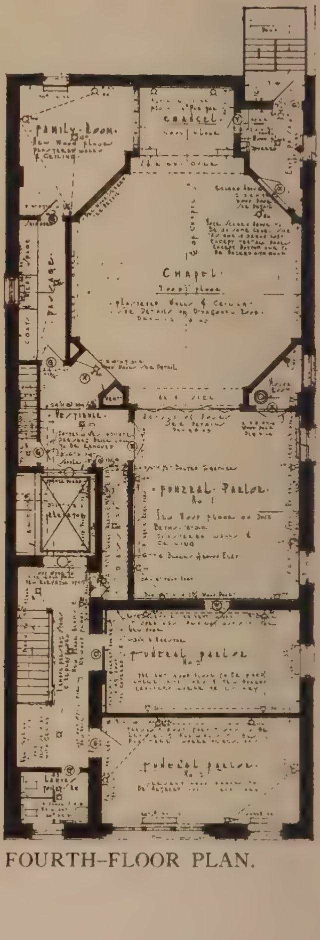
FIRST-FLOOR PLAN.



SECOND-FLOOR PLAN.



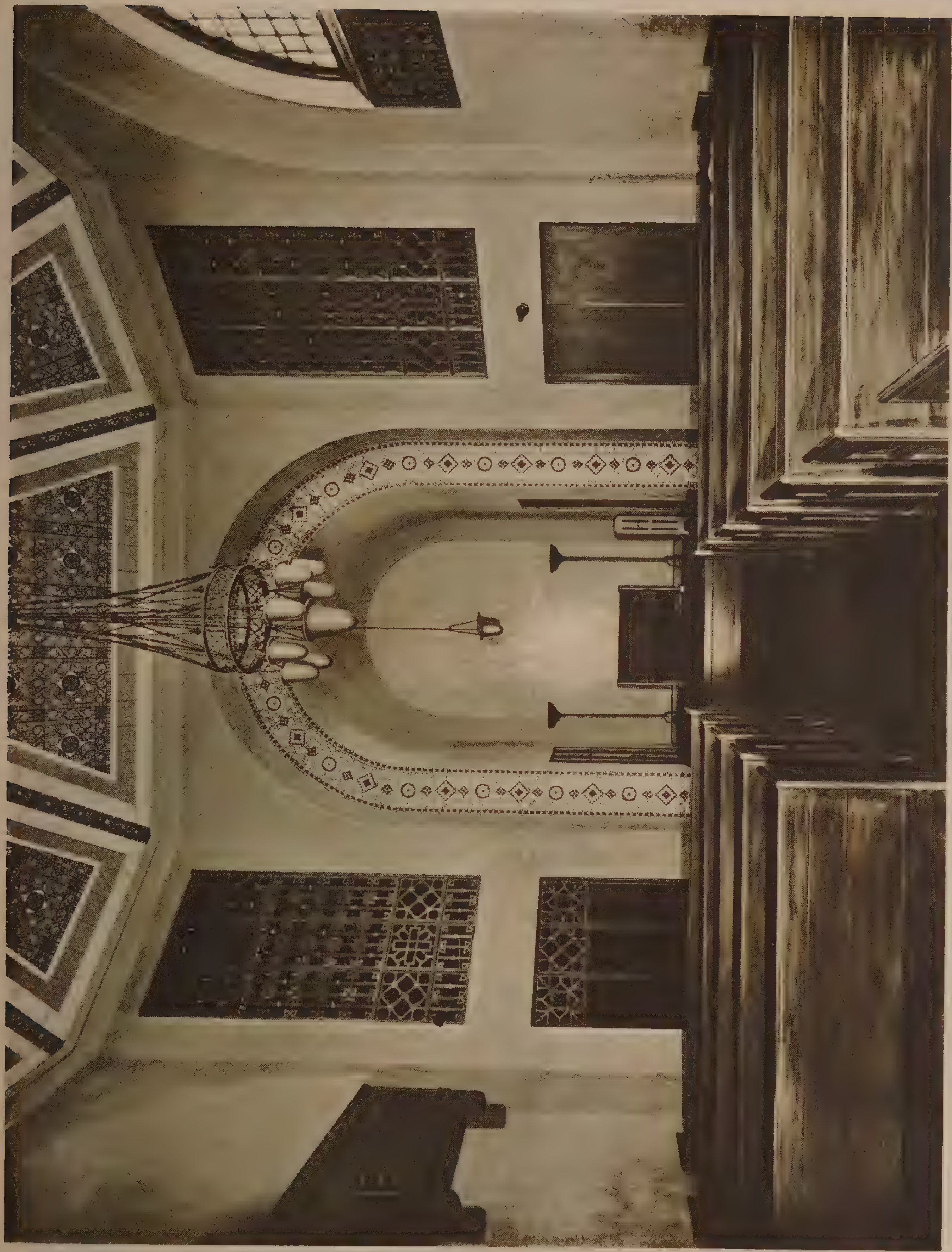
THIRD-FLOOR PLAN.



FOURTH-FLOOR PLAN.

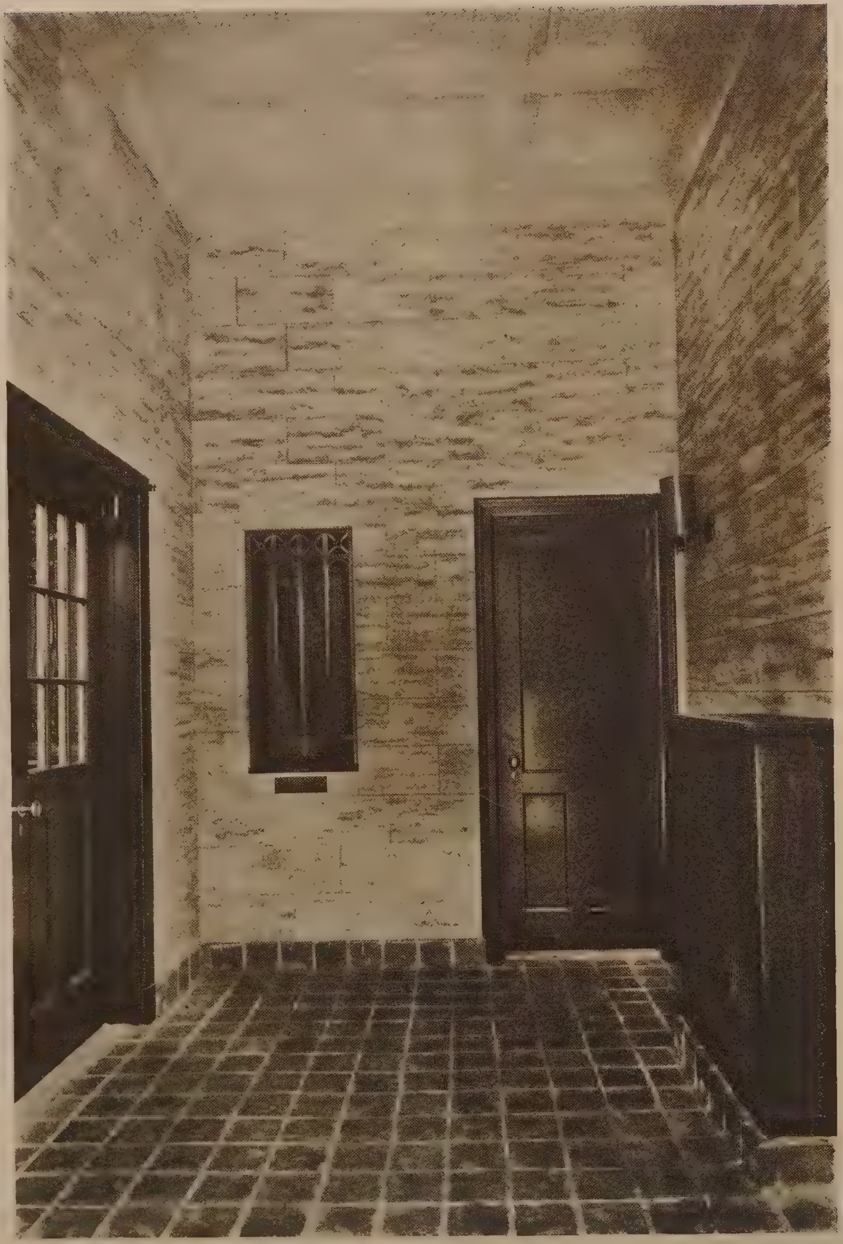
BUILDING FOR THE NATIONAL CASKET CO., INC., NEW YORK.

Clarence S. Stein, Architect.

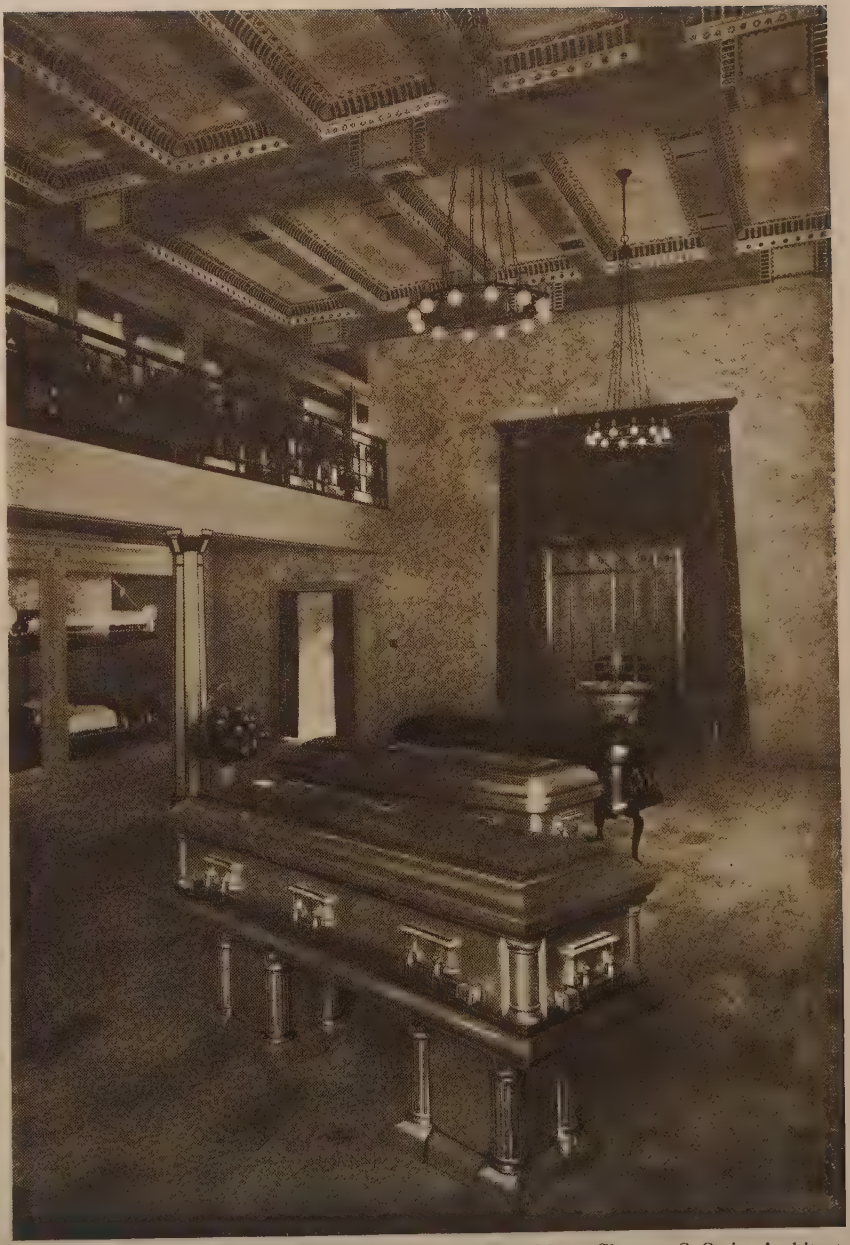


CHAPEL, NATIONAL CASKET CO., INC., NEW YORK.

Clarence S. Stein, Architect.



VESTIBULE.



MAIN EXHIBITION-ROOM TOWARD MAUSOLEUM. Clarence S. Stein, Architect.

BUILDING FOR THE NATIONAL CASKET CO., INC., NEW YORK.

Book Reviews

AMERICAN HOMES OF TO-DAY, THEIR ARCHITECTURAL STYLE, THEIR ENVIRONMENT, THEIR CHARACTERISTICS. By Augusta Owen Patterson, Art Editor of *Town and Country*. With half-tone illustrations. The Macmillan Co., New York.

The author classifies her architectural styles under seven heads, and illustrates her text with examples of work by most of the leading architects of the country. Her seven classifications are: the Colonial, the English, the Italian and the French Derivatives, the Elizabethan Picturesque, the Modern Picturesque, the Mediterranean.

The Elizabethan Picturesque and the Modern Picturesque are her own inventions. We are used to a buoyant and rather hypocritical attitude toward all traditions in these modern times, so if we feel a bit disturbed at some of the things the author says in the introductory chapters, we'll set it down to a regard for things that have always seemed to us worth much more serious consideration than is here given.

But we can almost forget the impression the text makes when we turn over page after page of admirable illustrations, and find shown there the work of famous and distinguished architects as manifested in some of the loveliest and most interesting homes in the country.

Few of us may have the privilege of visiting any of them in person, but in these pictures we may wander about the houses and grounds of the very rich and enjoy both the architecture and the landscape setting.

We may study the work of Delano & Aldrich, Allen & Collins, Lewis Colt Albro, Grosvenor Atterbury & Stowe Phelps, Wells Bosworth, Carrère & Hastings, Thomas Hastings, Myron Hunt & Elmer Gray, Harry Allen Jacobs, Guy Lowell, John Russell Pope, Benjamin W. Morris, H. Van Buren Magonigle, Murphy & Dana, Walker & Gillette, Trowbridge & Livingston, Charles A. Platt, Mellor Meigs & Howe, and others identified with some of our most distinctive and typical modern work. The entire country is represented by its show places in both exterior and interior views, city and country houses. And there are chapters on the Garden and Garden Ornament, Farm Groups, and Incidental Buildings.

After all, in a book of this intent it is the pictures that count; architects haven't time to read what is said about them, and some of them don't really care as long as their clients are happy.

SOME ARCHITECTURAL PROBLEMS OF TO-DAY. By C. H. Reilly, Roscoe Professor of Architecture, University of Liverpool. Hodder and Stoughton, Warwick Square, London, E. C.

Here are collected together a series of brief essays: "The Character of Our Civic Buildings," "Our Recent Government Buildings," "The Office Block," "Bank Buildings in England and America," "The Small Suburban House," "Our Big Railway Stations," "The Use of the Column," "The Emergence of a New Style," "Who Destroyed Our Towns?" "Architecture and Youth," "Colour in Street Architecture," "Every-Day Architecture," "Modern American Architecture," "The Choice of a Small Country House," "Wren as a Baroque Architect," "The Anti-Social Contract," "An Indictment of Coal Smoke," "The Bush Building of New York and London," "Bath and Bournemouth," "Regent Street, Old and New," "Fifth Avenue, New York," "Liverpool Cathedral," "Dublin in 1924."

Quite a variety of topics, and treated with a delightful absence of formality and with touches of humor. Professor Reilly goes about with wide-open eyes and with an equally open mind. Reading him is a good deal like listening to an alert and friendly talker. Naturally, the American reader will be interested in the author's impressions of our architecture, and be it happily said that he finds much to praise. "Their advance in the oldest and noblest of the arts has not only been relatively greater than ours, but their absolute achievement has been immeasurably greater too." He sees in Mr. Corbett's splendid Bush Building great promise for the future of London's business architecture. "Fifth Avenue is the most exciting street in the most exciting city in the world."

It is a pleasure to read a book of architectural impressions that so savors of the genial human note. Certainly there is no reason why scholarship may not step aside from the classroom pose of deadly seriousness and come out into the open, writing in terms that are both entertaining and instructive.

MASTERS OF ARCHITECTURE. JOHN FRANCIS BENTLEY. By W. W. Scott-Moncrieff. With 35 illustrations from photographs by F. R. Yerburg. Charles Scribner's Sons, New York.

"To most people the name of Bentley is unknown," is the way the author of the text begins his summing up of Bentley's career. And yet thousands have seen and studied and, maybe, wondered at the great Catholic cathedral of London, with which his name will be forever associated. We gather from the brief account of his work that he, in common with all men who give their lives to the effort of achieving some artistic ideal, fought against not only the discouragements of inadequate financial support, but even harder against the unsympathetic and obstructive judgments of those in power. The cathedral has been the cause of much discussion and no little criticism. There are many things to be said in appreciation, but the consensus of opinion of qualified authorities seems to be that it misses being the great achievement it might have been. That it is a remarkable and impressive thing goes without saying.

The cathedral is shown in mass and in detail in numerous photographs. Among other things by Bentley, all of them bearing the marks of his strong individuality, are the Church of the Holy Rood, Watford; Church of Corpus Christi, Brixton; St. John's School, Beaumont College, and a church in Nottingdale.

THE DOMESTIC ARCHITECTURE OF CONNECTICUT. By J. Frederick Kelly, A. I. A. New Haven: Yale University Press.

Mr. Kelly has done for Connecticut what Professor Fiske Kimball did for all of the Colonies in his immensely valuable book on "The Domestic Architecture of the American Colonies and of the Early Republic." He has written from the architect's point of view, and as well with a careful consideration of historic backgrounds.

That it has been a labor of love is made manifest in many of his references, but he has not allowed any personal prepossession to distort the truth or to emphasize unduly the particular Colonal architecture that has survived in so many of the cities and towns of that very New Englandish nutmeg State.

Connecticut in common with other colonies inherited her architectural ideas from the mother country, and many of her old houses show marked English influences. "The early Colonial houses were true in two respects, both of crucial importance. First, they expressed with entire simplicity and directness the conditions which produced them. Secondly, and hardly less important, their implication was always intensely intimate, *domestic*."

And happily these essentials of old have survived in many of the modern adaptations of Colonial, and unless they are preserved the result is a flat failure.

The old builders nowhere better preserved their English traditions than in the almost universal use of oak, and how they managed to cut their timbers and to raise them in finished frames is a cause for admiration and wonder.

Though English in feeling, these Connecticut houses were by no means slavish copies of old country originals; they had character and individuality of their own.

Mr. Kelly begins, as the architect should begin, with the development of the plan, and illustrates this chapter with drawings of structural details and photographs.

The great chimneys of the old houses were always an interesting feature, and towers of strength in heavy storms. The writer well remembers that the wide foundations and massive upper structure of one old chimney in a certain Connecticut house probably saved it from being blown down in a great storm of wind that left death and destruction in its wake. From the plan the author goes on to the House Frame and Its Construction, Roof Framing, the Overhang, the Summer Masonry, the Outside Covering, Windows, Front Entrances: Early Types, Later Types, the Main Cornice, Interior Woodwork, Panelling, Mantels, Cupboards, the Stairs, the Mouldings, Hardware.

Each chapter is admirably illustrated with drawings and with photographs of notable period houses.

The book is a valuable addition to the records of our Colonial architecture, a book for the architect of essentially practical value, and a book for every one interested in the story of the development of American architecture.

THE ARCHITECTURE OF JOHN RUSSELL POPE. With introductory text by Royal Cortissoz. Part I. Portfolio. William Helburn, Inc., 418 Madison Avenue, New York.

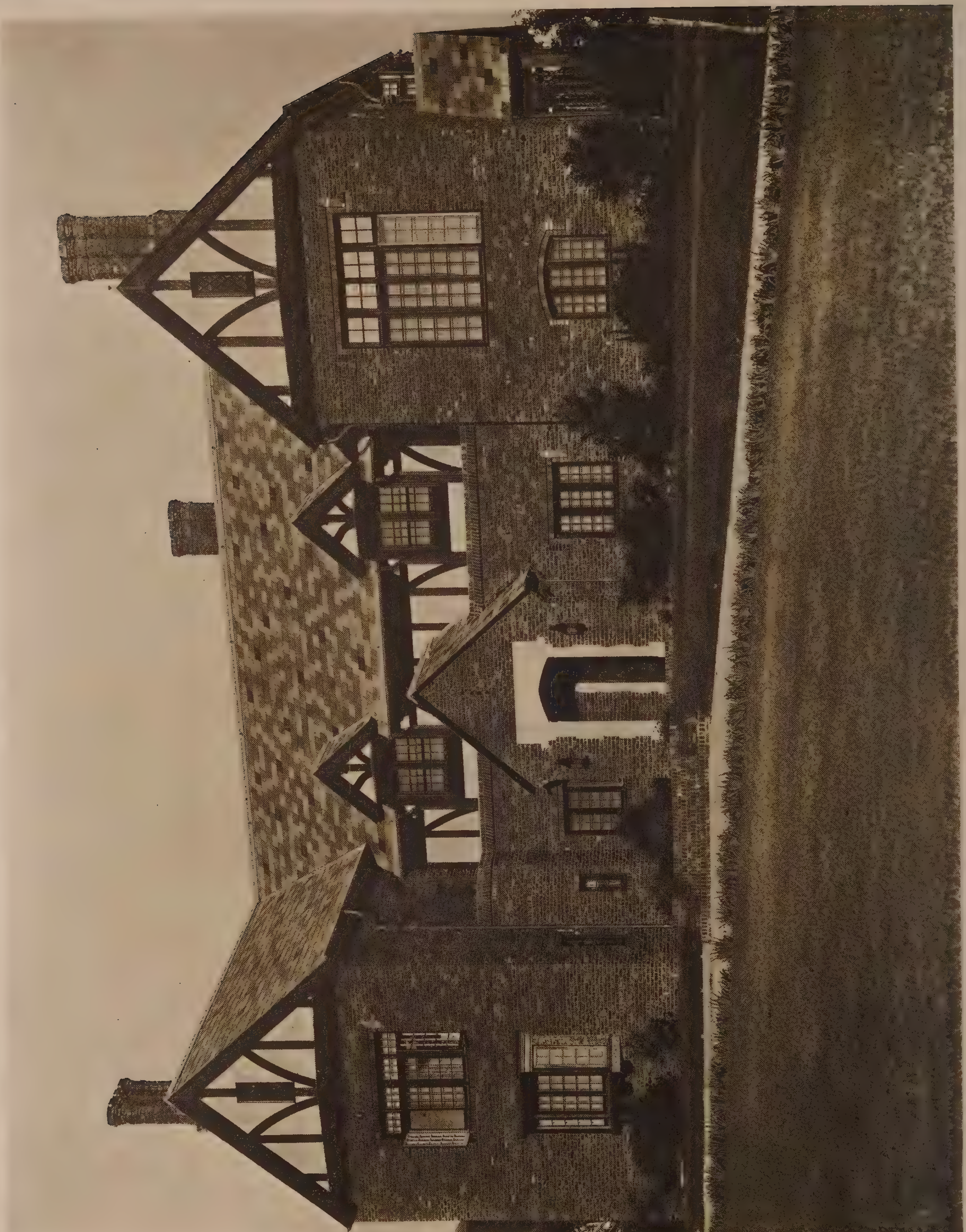
There are to be three volumes given to Mr. Pope's distinguished work, issued in twelve parts, each of which is to contain twenty-five plates. These will include photographs from completed buildings, sketches, measured drawings, and plans. The volume and distinction of Mr. Pope's work, embracing as it does such monumental buildings as the great Scottish Rite Temple in Washington and other public buildings, many private residences marked by both originality and a fine scholarship, make available to the profession and to all interested in the progress of American architecture a work of importance and value. In this first part are included several notable private residences that express with fine dignity the architect's knowledge and his exceptional capacity for giving individuality and character to work in this special field.

The houses included are the residence of Mrs. Guy Fairfax Cary, Jericho, Long Island; James Swan Frick, Baltimore; Honorable Robert L. Bacon, Westbury, Long Island; George Hewitt Myers, Washington, D. C.

Announcements

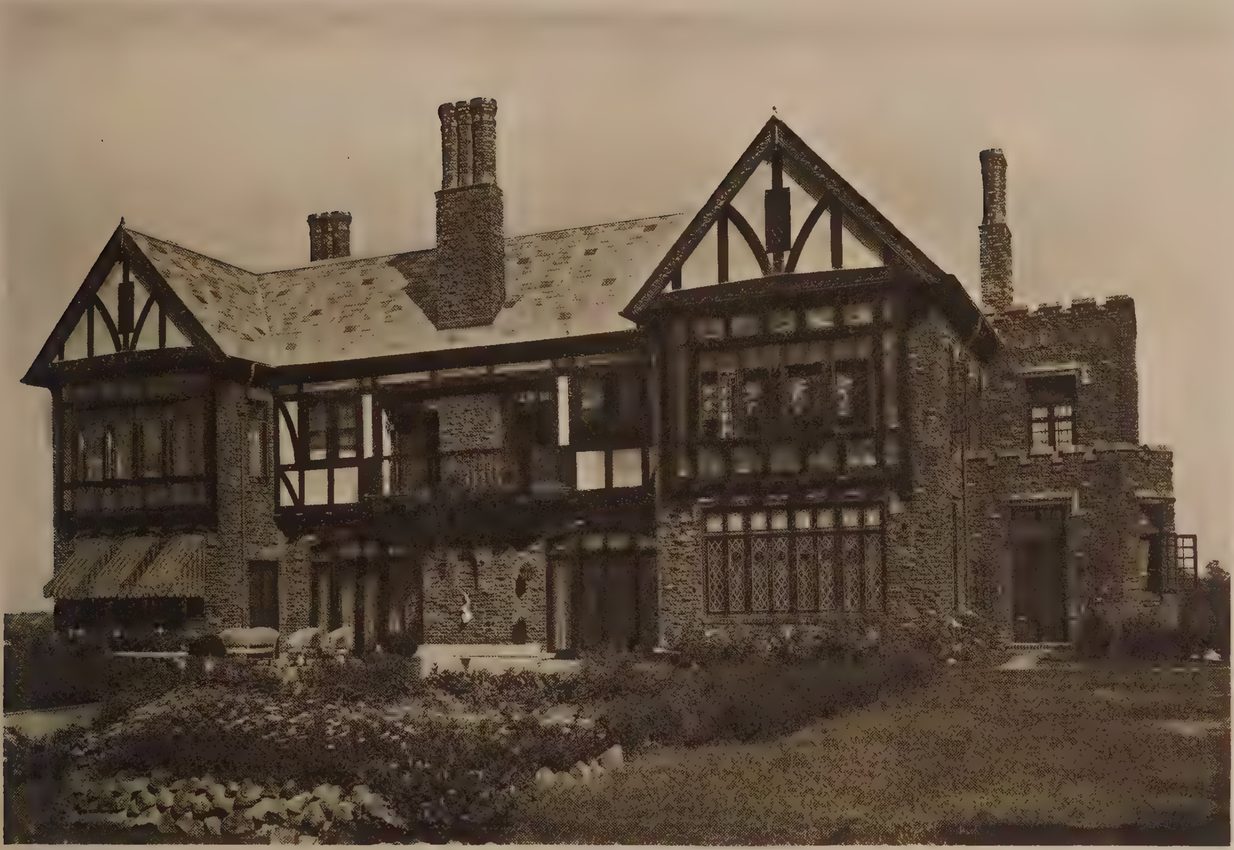
The Ballinger Company announces, with deep sorrow, the death of Walter F. Ballinger, which occurred suddenly on December 21, 1924. It is a testimony to his character and to the pleasant personal relationships existing in this organization, that the heads of our several departments have been associated with Mr. Ballinger on an average of over fifteen years. In continuing the business, "it will be our high ambition, as well as that of every one of the seventy members of this organization, to maintain the high ideals and principles established by its founder."

The Ballinger Company: Robert I. Ballinger, William R. Fogg, Clifford H. Shivers, Carl de Moll, Jean Paul Richter, Josiah H. Smith, George W. Stinson.

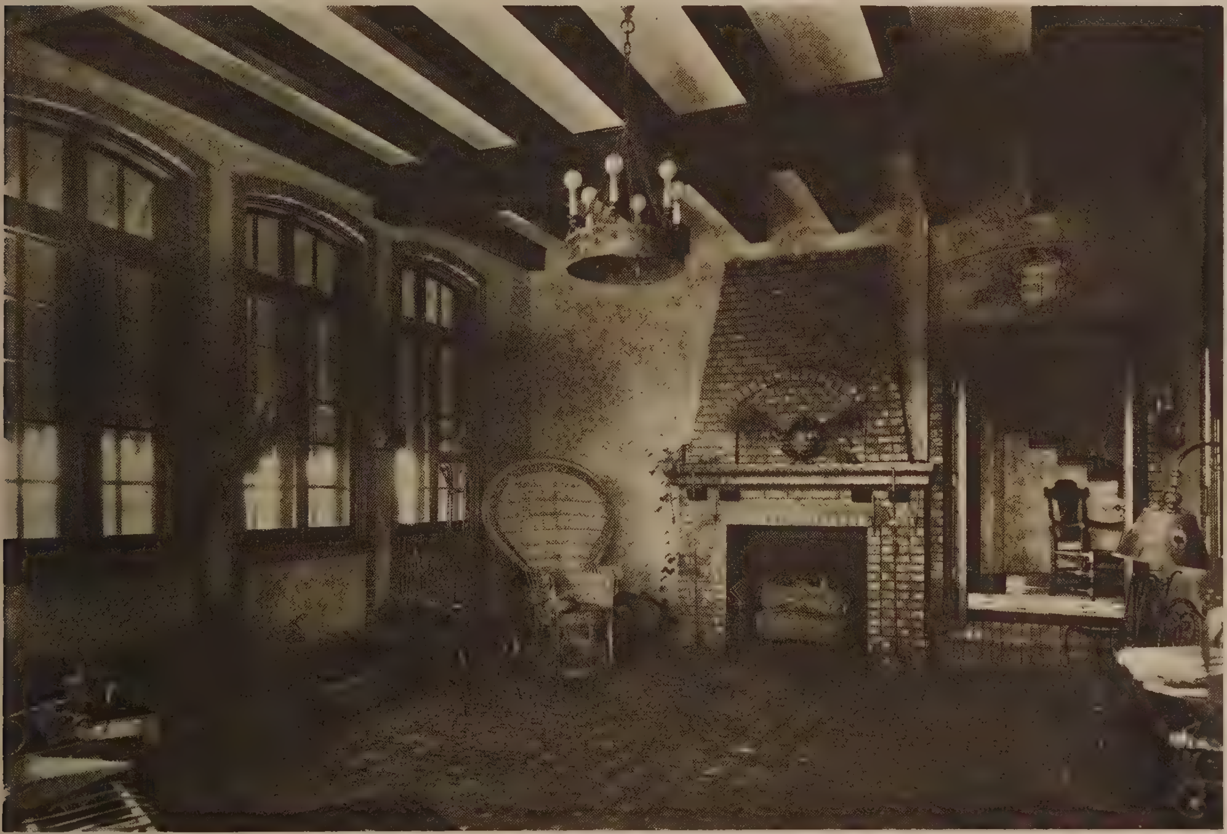


RESIDENCE, J. D. OPPENHEIMER, SAN ANTONIO, TEXAS.

Atlee B. Ayres, Robert M. Ayres, Architects.



GARDEN FRONT.



SUN ROOM. Atlee B. Ayres, Robert M. Ayres, Architects.

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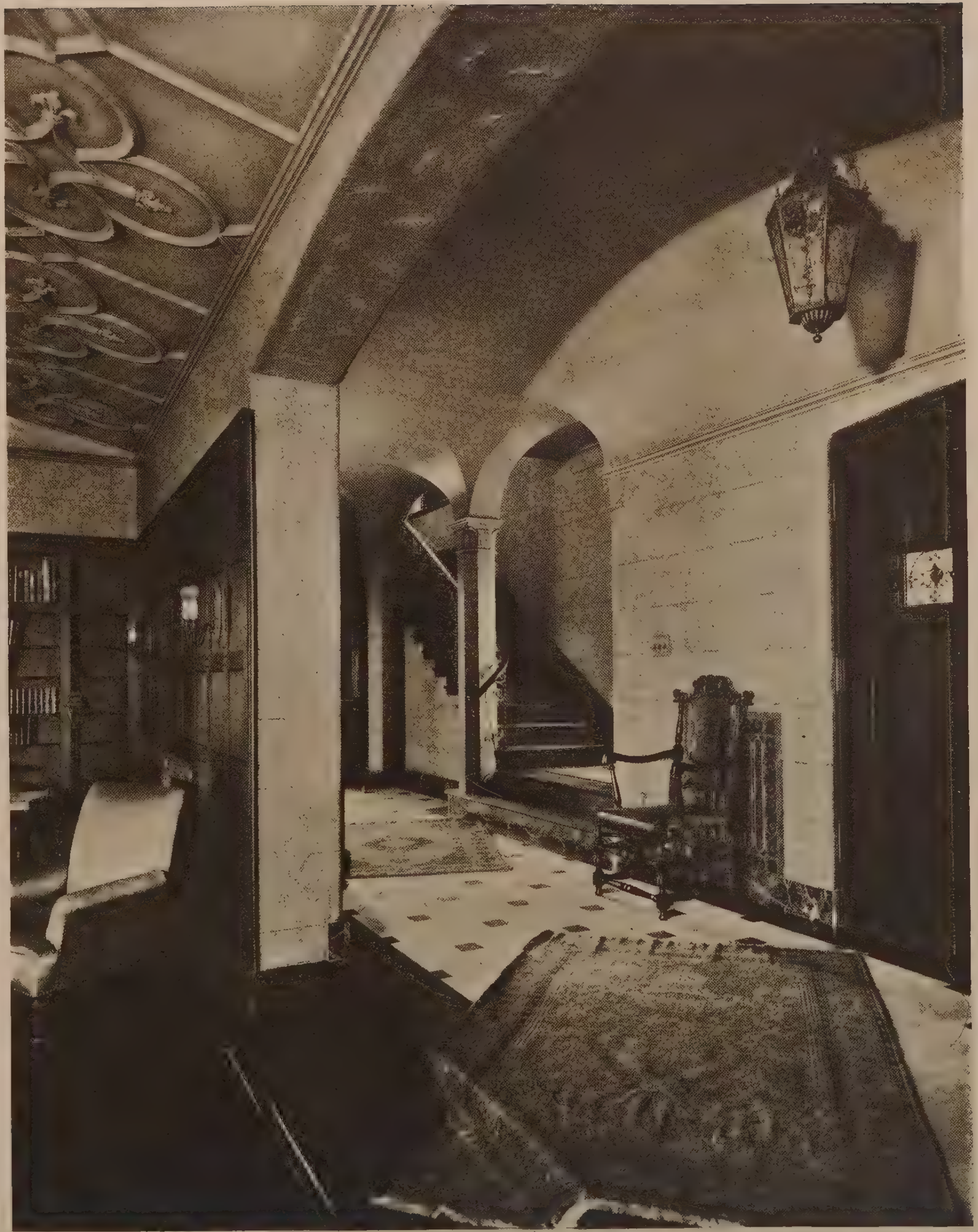
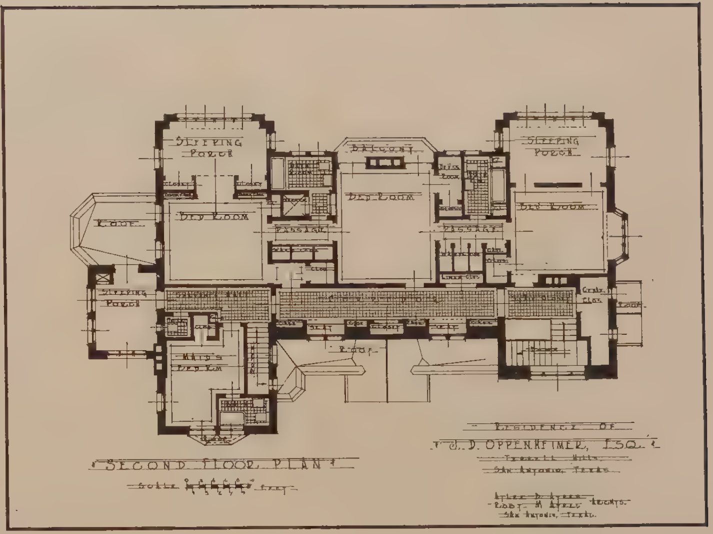
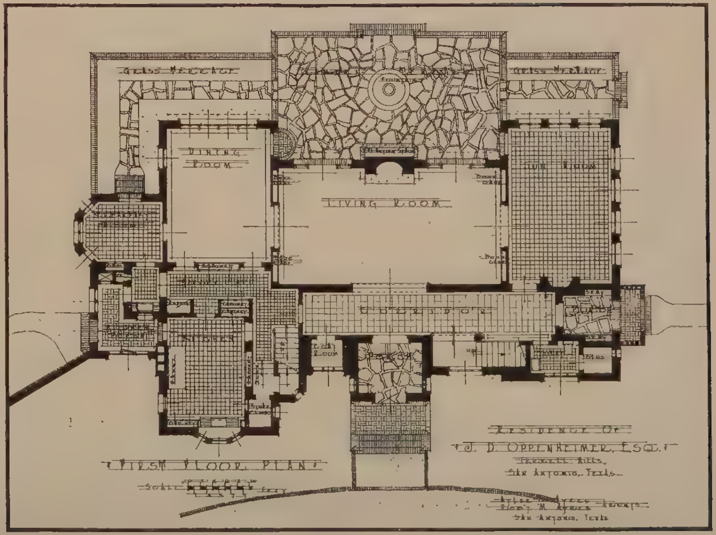


CORRIDOR AND STAIR-HALL.





Atlee B. Ayres, Robert M. Ayres, Architects.

RESIDENCE, J. D. OPPENHEIMER, SAN ANTONIO, TEXAS.

Copper, Lead, and Tin

By David B. Emerson

THESE three metals are, after iron, the most important metal elements which enter into building construction; in fact, the four constitute at least 95 per cent of all the metals used in building.

Zinc, which until quite recently was used principally as an alloy with other metals, and as a coating for iron and steel, is rapidly coming to the front, but as yet is not used very extensively; and the use of nickel, silver, and gold as a plating for the baser metals makes them a negligible quantity.

Copper is the very first metal that man ever mined or worked, it having been used alone before, by alloying with tin and lead, bronze was discovered. The greater portion of the pure copper which is used in building is in sheet form. Sheet copper is graded by its weight in ounces to the square foot of superficial area. Sixteen-ounce, eighteen-ounce, and twenty-ounce being the weights most generally used in building construction, although for some purposes, such as copper shingles and the covering of wood mouldings in show-window construction, as light as nine-ounce is used.

Sheet copper is divided into two classes: hard or cold-rolled copper, and soft or hot-rolled copper, designated by the trade as "cornice temper" and "roofing temper." All sheet copper is produced by heating and rolling until very nearly the required thickness is reached; and then, if soft copper is required, it is reheated and rolled, and then given a final heat treatment or anneal, to remove the hardness caused by rolling. Only soft or "roofing temper" copper should be used for roofs, flashings, and the linings of built-in gutters, and hard or "cornice temper" copper should be used for all cornices, hanging gutters, leaders, skylights, and copper-covered mouldings.

The weight of copper which should be used for any specific purpose is for the most part a matter of judgment, although sixteen-ounce is the weight most generally used for roofing, flashing, gutters, and leaders and it is for almost all cases sufficiently heavy. For cornices of any size eighteen and twenty-ounce are to be preferred to the lighter-weight metal.

On account of its non-corrosive quality, copper is, in so far as the life of a building goes, almost everlasting and, when once applied, it should under ordinary conditions last as long as the building itself.

Copper has only one great fault, and that is its expansion and contraction, and wherever it is used, the greatest care should be taken to see that proper allowance is made for the movement of the copper, as in many cases roofs and flashings which would otherwise have been practically perfect have failed through neglecting to make the proper allowance for expansion and contraction.

In using copper gutters and leaders, one word of caution must be given, and that is, never use iron hangers or leader hooks, because when copper and iron or steel are in contact, with water present as an electrolyte, the iron is always corroded; therefore, always use brass or bronze hangers and leader hooks.

Aside from the uses already mentioned, copper has many other uses in building construction.

For range boilers, copper is undoubtedly the very best material that can be used, as it lasts indefinitely, can be easily repaired if a leak occurs, and finally when beyond repair, it, like all copper, has a positive salvage value.

In all of the larger hot water storage tanks and heaters where steam is used for heating the water, copper tubes, on account of their heating power, freedom from corrosion, and great ductility, are always used.

Probably the greatest of all of the uses of copper is in electrical work, where it is used exclusively for wire, buss bars, switch contacts, etc.

One difficulty which may have been encountered by many of the readers in using copper for cornices, gutters, and leaders is the difficulty in keeping them painted, due to the fact that a good bond cannot be obtained between the metal and the paint. This is caused by the grease and oil of the manufacturing process, which is rolled into the fine pores in the surface of the sheets.

Except for purely æsthetic reasons, copper needs no painting, as it is no way affected by the action of the elements, so needs no protective coatings whatsoever. Before doing any painting it is necessary to clean thoroughly and roughen the surface of the copper. This should be done by washing it with a solution composed of eight ounces of copper sulphate, in one gallon of luke-warm water, to which should be added one-quarter ounce of nitric acid. This solution should be mixed in a glass or earthern vessel, and the surface of the copper should be thoroughly washed with clear water to remove all traces of the solution before doing any painting. A simpler method, which is sometimes quite successful, is to wash the surface of the copper with benzine.

Copper, as has been previously noted, is used in numerous alloys, with tin and lead to produce bronze, with zinc to produce brass, and with nickel to produce Monel metal.

Lead, like copper, has been used for many centuries; in fact, the name plumber is derived from the Latin word "plumbi" or lead, and it formerly denoted a worker of lead, and not one who installed water supply and drainage pipes as it is now used.

Lead, like copper, comes in sheet form, but it is graded by its weight in pounds to the square foot of superficial area instead of in ounces as is the case with copper. The weights run from two and one-half pounds per square foot to twelve pounds per square foot. The weights most generally used in building construction are two-and-one-half-pound, three-pound, three-and-one-half-pound, and four-pound, which are from one-twenty-fourth of an inch in thickness for the two-and-one-half-pound to one-sixteenth inch in thickness for the four-pound.

Sheet lead is very frequently used for flashing and is almost if not quite as good as copper for this purpose, particularly for flashing around soil and waste pipes where they come through the roof. As a roofing material sheet lead has given most excellent service, many of the English cathedrals having been roofed with lead which has in some cases stood for centuries.

One of the most interesting uses of sheet lead, from an artistic standpoint, is the making up of ornamental leader-heads, gutters, spouts, finials, and other ornamental work. In this class of work the English lead workers have practically led the world, but for the past few years this class of work has also been done in this country. As evidence of the lasting quality of sheet-lead work, there is, or rather was in the summer of 1923, when I saw it, a lead cistern in the yard of Lincoln College, Oxford, dated 1475, and it was then in good condition.

New York City has two very beautiful pieces of ornamental lead work: the roof over the small turret on the south side of Saint Thomas Church, and the fleche on the South Church on Park Avenue, both of which were fabricated in England. Apart from the artistic uses of lead, sheet lead is, without a doubt, the best material known for the lining of tanks for holding water and other liquids.

The successful use of sheet lead, either for ornamental work or for tank lining and other similar uses, is largely dependent upon how the sheets are joined together. This should always be done by burning the lead, and not by soldering. Lead-burning is the process of fusing two pieces of lead together without the use of solder, and is done by melting the edges together a drop at a time, using a blowpipe with either hydrogen gas, illuminating gas, or gasolene.

Soldered joints in lead are generally unsatisfactory; in roofs, gutters, and other exterior work, the lead expands and contracts with the changes in temperature, and, the solder being harder than the lead, the lead breaks; in tanks, the lime and other deposits in the water destroy the solder by attacking the tin, causing leaks.

Lead pipe is known and used practically everywhere; it was used by the Romans nearly two thousand years ago, and the specimens which have been preserved are in good condition to-day.

The only fault which lead pipe has is, that it will sag, on account of its weight and great flexibility, especially when it is used for hot water piping. On account of its tendency to sag, most plumbing authorities recommend that it be used only for short and irregular bends. For the connections between water-closets and the soil lines, there is probably nothing equal to lead pipe, as the connection has to be securely fastened to the floor flange and to the soil stack. If a rigid material like iron is used, any settlement of the floor would be liable to break the pipe or loosen the connection, whereas, lead being flexible will move with the settlement, and the connections will remain perfectly tight. Objections are sometimes made to the use of lead pipe, because rats are liable to gnaw it. This can be prevented very easily, by wrapping a galvanized wire netting around waste pipes and water-closet bends, and soldering it to the pipes.

Hard lead, a secret process, probably produced by alloying lead with antimony, tin, or zinc, or with two of the three metals, was put on the market a few years ago, but for some reason it was apparently not a great success, and as it is no longer advertised, it may be inferred that it is not being made at the present time.

Tin, although it is one of the most indispensable metals used in building, is seldom used alone, but is generally mixed with some other metal. Solder, which is absolutely indispensable in sheet metal work, is one-half tin and one-half lead. Roofing tin or terne plates, as they are called by the trade, are sheet steel or sheet iron, coated with a mixture of tin and lead.

Although there undoubtedly are better and more lasting roofing metals, where cost has to be considered, a tin roof, provided the plates are of rustless iron and the coating is fairly heavy, is a very good roof, and if it is painted at regular intervals will last for many years. Roofing tin is also a good material for flashings, but it is conceded by practically all authorities to be inferior to copper and lead.

Pure tin is known as block tin, and is used for various purposes. Block-tin pipe is for many uses superior to lead pipe, as it is quite as non-corrosive and is much stronger, the ratio of strength being three and a-half to one. One of the most frequent uses of block-tin pipe is for cooling coils in ice-water systems, because it may be readily bent into continuous coils, giving a long travel to the water in close contact with the ice; because, on account of its non-corrosive quality, very small sizes may be used, making the cooling process quicker and easier; and because of its hardness it is not easily crushed by the impact of the ice in filling the box.

Iron pipe lined with block tin is frequently used where the water supply has a particularly corrosive effect on iron. In using tin-lined iron pipe, it is necessary that all fittings should also be tin lined or the results which are obtained by the use of the tin-lined pipe will, to a great extent, be nullified by the corrosion of the fittings.

Apart from these very practical uses, block tin has a decorative value, it being used to ornament lead work, where its bright silvery lustre makes a most pleasing contrast with the dull gray of the lead. For this particular use it is generally burned on and becomes practically a part of the lead.

It can be easily seen that the three metals which are the subject of this article are indispensable to building construction, but what is most important is, to know which to use, where to use it, and how to use it properly, so that the best results may be obtained from both the practical and artistic standpoints.

An Architect's Simple Engineering Problems

By DeWitt Clinton Pond, M.A.

FIFTH ARTICLE

MOST of the work that has been described in previous articles has been of a general nature, and it may have seemed that it did not apply to any particular problem. In this article a problem that was presented by an architect to an engineer will be discussed. It was a simple one, and the reader who has followed these articles would have had very little difficulty in finding a solution for it, and yet it was not very different from many that are encountered by architects in their daily work. The building which the architect was designing was a rectangular one measuring approximately 31 feet by 28 feet, only one story high, with masonry walls, and had to have a fire-proof first floor and roof. There was a cut-off masonry wall extending across the building on which the beams might rest, as shown in Fig. 8.

In this particular case it was possible to divide the width of the building into three spans, and the slab which spanned between the beams was considered as continuous. As the formulas for determining the bending in the slab would be $M = \frac{1}{}Wl$ and $M = \frac{1}{10}Wl$ for the centre span and the two outer spans respectively, if it were desirable to maintain the same reinforcement throughout in the direction perpendicular to the beams, it would be necessary to make the centre span wider than the outer ones in proportion of 12 to 10. Actually the centre clear span measured between the edges of the concrete fire-proofing was made 10 feet, and the outer spans were therefore 7 feet 5 inches between the fire-proofing and the outer walls. This makes the design for the centre span more than safe for the outer spans.

The first consideration that the engineer has to take up with the architect when attacking such a problem is the question as to the proper live load to use. In the case under discussion this was taken as 40 pounds, as the building was to be used as a kitchen in connection with a large dining-hall. The next question that the architect should decide would be whether there should be any fill and finish. It was decided that the finish should be monolithic, and therefore the only dead load, as far as the slab was concerned, was the weight of the slab itself.

In the previous articles it was pointed out that the law required slabs to be 4 inches thick, and so, in the present case and for the purpose of determining the load upon the slab, the dead load will be taken as 48 pounds, and the total dead and live loads will be 88 pounds per square foot.

If the reader has followed the previous articles, he will understand that the floor will have to be made of rock concrete, as the span between the two centre beams is more than 8 feet. It is also advisable in such a case to determine whether the proper thickness of slabs should be more than the usual 4 inches.

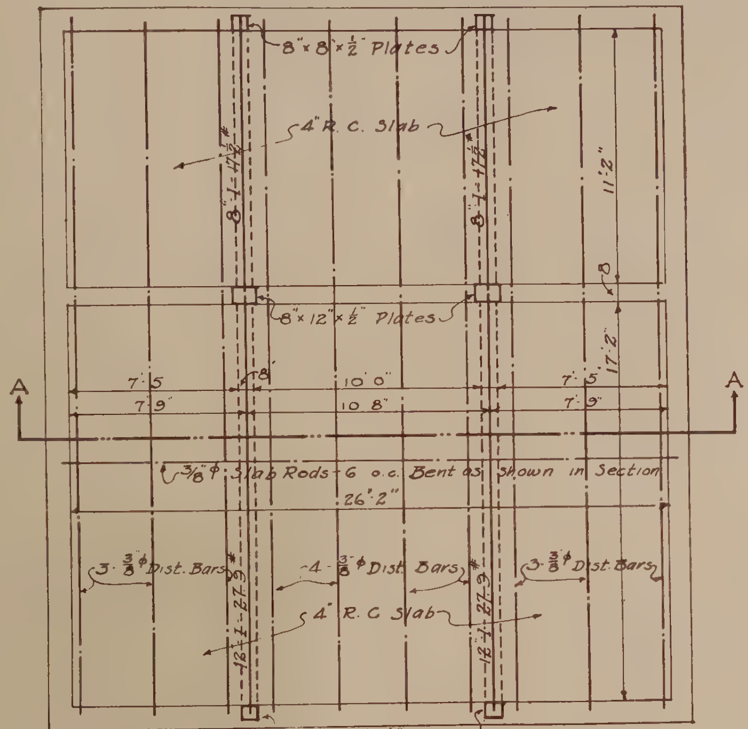
The method given in previous articles of finding the allowable effective depth of steel below the top of a slab can be used, and this may be expressed in the formula given below and which was used by the engineer in this case:

$$W = 88 \times 10 = 880$$

$$d = \frac{880 \times 120}{\sqrt{12 \times 1{,}280}}$$

$$d = 2.6 \text{ inches.}$$

The combination of formulas into the simple form given above may seem to present difficulties to the reader, but it is by no means impossible to see what the engineer had in mind when he carried out his calculations. The moment was found by multiplying the load, which was 880 pounds, by 120 and dividing by 1,280 and extracting the square root. The result demonstrated that the thickness of 4 inches and an effective depth of 3 inches would be safe as far as compression in the concrete was concerned.



Note: All reinforced concrete to be mixed in proportions of 1 Bag of cement: 2 Cu. Ft of Sand: 4 Cu. Ft of Stone or Gravel

Note: Reinforcing Rods to lap 1'6" with ends securely tied where rods are not in one length

FIGURE 8

The next step taken by the engineer was the determination of the stress in the steel. The formula that was used is given below:

$$\text{Stress} = \frac{880 \times 120}{12 \times \frac{7}{8} \times 3} = 3{,}360 \text{ pounds.}$$

To those who have followed the discussion the reason for using the calculations should be clear. The moment found as described in the preceding paragraphs is divided by $\frac{7}{8}$ of 3.

It might seem a repetition of work in finding the moment twice, but if the fact is borne in mind that most engineers develop their calculations by means of slide rules, it will be seen that to use the combinations given above is the most simple method.

Once the stress has been determined, it is necessary to find the area of steel required, and this can be done by dividing 3,360 by 16,000, and the result —.21 square inches— indicates that two ⅜-inch round bars spaced 6 inches on centres will supply more than enough steel to withstand the pulling stress. The cross-sectional area of one bar is .1104 square inches, and two bars in each foot will supply .2208 square inches. Actually the bars might have been spaced 6.25 inches on centres.

Some of the considerations that are usually taken into account were not used in the above calculations. The clear span was taken as simply 10 feet, and the depth of the slab was not added to this in finding the moment. However, as the depth of the slab was more than required by the calculations and slightly more steel was added, the slab was safe. It would be interesting for the reader to check this.

As has been stated, the reinforcement can be carried through for use in the outer slabs, as the span is less than that of the inner one.

In addition to the reinforcement rods which are placed at right angles to the beams, there should be distributing bars spaced as shown in the figure.

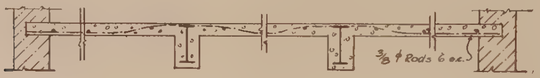
All that has been said with regard to the design of the slab is simply a review of much that has been said in regard to previous problems, and the advantage of this discussion has been to show how the principles which were taken up before can be applied to actual conditions.

The building under consideration was located in a somewhat remote section of New England, and it was doubtful whether the contractor could employ men who were familiar with building forms and placing reinforcing bars. Therefore, it was decided that the beams should be of steel, so that they could be secured without difficulty.

The beams were spaced, as shown in Fig. 8, 7 feet 9 inches from the wall and 5 feet 4 inches from the centre of the building. The area of floor carried by the long beams will therefore measure approximately 9 feet by 18 feet. The live load and slab load over the area will be found by the following calculations:

$$88 \times 9 \times 18 = 14{,}256 \text{ pounds.}$$

The beams can be assumed to be 12 inches deep with 5-inch flanges, and the engineer locates them 1 inch below the top of the slab. The area of concrete around them will measure 11 inches by 8 inches and will weigh 88 pounds per foot, and the steel beam can be considered as weighing 28 pounds per foot, so that the added weight of the beam and fire-proofing will be found by multiplying 116 pounds by 18 feet, giving a result of 2,088 pounds. The total load on the beams can be taken as 16,300 pounds.



SECTION A-A
FIGURE 9

By referring to the tables of safe loads, as explained in the last article, for a span of 18 feet, the reader will see that a 12-inch 27.9 I beam will carry a load of 19,700 pounds, and this is the lightest beam which will be selected for this purpose.

Over the shorter span the same method of calculating loads will result in calling for an 8-inch $17\frac{1}{2}$-pound I beam, as shown below:

$$\begin{array}{rcl} 88 \times 9 \times 12 & = & 9{,}504 \text{ slab load.} \\ 116 \quad \times \quad 12 & = & \underline{1{,}392} \text{ beam load.} \\ & & 11{,}892 \end{array}$$

An 8-inch $17\frac{1}{2}$-pound I beam will carry a load of 13,000 pounds over a span of 12 feet.

Because the roof and first floor were very similar, the plans for the two floors were made practically the same.

There were bearing plates designed to be placed under the ends of each beam. These plates are of steel and usually $\frac{1}{2}$-inch thick for conditions similar to those in this problem. The area of the plates is usually arrived at through general familiarity with such work. Nothing smaller than 8-inch by 8-inch plates are used, and it will be seen that this is the size of plates used in the outer walls. The engineer also called for larger plates for the inner walls, as it was naturally known that the load on the inner wall would be heavier than that on the outside.

It might be advisable to check the sizes of these plates, so that the reader will know how large a margin of safety is allowed by the engineer.

By referring to the safe-working stresses allowed by the New York Building Code, it will be seen that brickwork laid in Portland-cement mortar is considered as having a safe-bearing stress of 250 pounds per square inch. It was seen that the load on each of the long beams was 16,300 pounds, and the load on each of the short ones was 11,900 pounds, making a total of 28,200 pounds. One-half of each beam load will be carried by the outer walls, so that only one-half of the total load on the two beams will be carried by the inner wall, and this load will be 14,100 pounds. By dividing this by 250, it can be found that only 56 square inches are required for bearing. The plates having an area of 8 inches by 12 inches are about twice as large as necessary, but smaller plates would hardly be practical.

The design is shown in Fig. 8, and a section through the floor construction in Fig. 9. It can be seen that the reinforcing bars are bent so that they furnish reinforcement where there is negative bending over the beams. According to the theory of continuous beams, there is positive bending at the centre of the span and negative bending at the supports. There is only positive bending in the outer spans, and the steel remains at the bottom.

In Fig. 8 the distributing bars are shown, and it is of interest to observe that the notes call for a lap of 1 foot and 6 inches where bars do not run through in one length. This note has general application, although in the present case the bars will all run through. The proportions of the ingredients in the concrete are also noted, and this is important, as the design is based on the strength of concrete mixed in proportion of one part cement to two parts sand to three parts broken stone or gravel.

All that has been stated is in accordance with the information given in previous articles, and the slabs and beams can be designed without any special engineering knowledge. However, even in a problem as simple as this, there can be found details that require a somewhat more comprehensive knowledge of engineering design. A stairway is indicated on the architect's drawing. The stair is between the basement and first floor, and so there must be a hole left in the first floor through which it can pass with the proper head room. If this were merely a rectangular opening between beams, there would be nothing particularly troublesome about it, as it would be necessary to leave the opening at such a point as called for on the architect's drawings and span on either side of it with the reinforced slab. However, the stair turns at right angles, and this makes it necessary to provide a landing at the top which must be designed as a cantilever. This makes it necessary for the engineering designer to understand what is meant by a cantilever, and how to design a slab or beam that is not supported or loaded, as all the slabs have been in previous articles.

In order to explain how such special conditions are met, the following article will take up a discussion of some of the more simple principles of engineering design, such as concentrated loads and uniform loads that do not extend over an entire span.

Zinc Used for Roofing

By Chas. E. van Barneveld

Mining and Metallurgical Engineer, Bureau of Mines, Department of the Interior

Advantages of Zinc Roofing.—1. Zinc is a permanent roofing material; that is, when suited to the conditions, and properly applied to a roof designed with the right purlin spacing, it will outlast the building and still have a salvage value equal to at least half the original material cost. 2. It is applicable to a wide range of conditions, from the most expensive to the cheapest type of construction, and is not greatly above the cheaper materials in first cost. A permanent roof of simple outline need not cost over $15 to $25 per square (100 square feet), depending upon the method of construction required; a corrugated sheet roof for industrial purposes, or for farm use, need not cost over $15 per square for ordinary conditions. 3. Corrugated-zinc sheets have the distinct advantage of being available for re-use and reconstruction if handled with ordinary care. 4. Zinc oxidizes to a certain point, building up a strong protective coating which in time effectually checks further oxidation; thus it does not oxidize to the point of destruction, as steel does. 5. It is light and easily handled.

Disadvantages Applying to the Use of Zinc for Roofing.—On the other hand, zinc has some minor disadvantages. Every one connected with building, from the mechanic to the handy man, is familiar in a general way with the behavior of steel sheets, and when first brought in contact with the use of zinc must have impressed upon his mind the fact that zinc has certain different characteristics from steel, that require different handling.

1. Special fasteners must be used. 2. Provision must be made for expansion; this applies not only to sheets but to pipes; for instance, slip-joint gutter and pipe connections of from 1 to 1½ inches are necessary when zinc down-spouts are used. 3. Zinc must not come in direct contact with other metals (except lead), particularly when wet. 4. Zinc is brittle when cold. Generally speaking it is undesirable to make a zinc installation at temperatures much below 40 degrees Fahrenheit.

There are certain conditions under which zinc should not be used at all. These conditions apply principally to industrial installations, and will be briefly discussed:

1. A zinc roof is not suitable for a smelter building or foundry; the combined effect of excessive heat and corroding fumes being too severe. The melting-point of zinc is 786 degrees Fahrenheit. Long before this point is reached a corrugated-zinc sheet laid on purlins would sag, and be unable to support its own weight. Just what that point is has not been determined. The critical temperature of rolled zinc is 280 degrees. Just how much greater temperature a corrugated-zinc sheet of 14-gauge supported on a 4-foot span would stand before sagging of its own weight, would be hard to say.

2. Zinc should not be used on ocean-front construction, where it would be subject to continuous salt-water spray; neither should it be used under conditions which might produce electrolysis. By way of illustrating the latter point the following case might be cited: In the vicinity of New York, on the Hackensack meadows, a metallurgical company has used considerable corrugated zinc in construction. This is giving good service with the exception of one unit, which is subject to a combination of carbon deposit from smoke and salt-water spray, thereby setting up electrolysis, which destroys the zinc. Salt air alone is not injurious to a zinc roof. The possibility has been suggested that an electrolytic couple destructive to zinc is set up when zinc sheets are placed direct on iron purlins, especially in contact with moisture. However, zinc may be placed direct on properly painted iron purlins, or 1-inch wood strips may be bolted to the purlins.

3. Zinc should not be subjected to direct concentrated sulphuric-acid or nitric-acid fumes; but it does not suffer from reasonably dilute fumes which would be detrimental to steel sheets. Reference has already been made to the progressive weathering or corrosion of zinc, which produces a protective coating of uniform depth, on any rolled zinc of fairly heavy gauge, beyond which depth all action ceases. This coating is *not* a zinc hydroxide (which would be affected by even dilute fumes), but is a hard and difficultly soluble basic carbonate which most effectively protects the remaining metal. The following circumstance will perhaps serve to confirm this statement. In 1908 the Illinois Zinc Co., of Peru, Ill., built a new office building roofed with 13-gauge zinc, formed as Spanish tile. This roof is roughly 100 feet distant from the kilns in which zinc-sulphide ore is roasted, and 200 feet from the stacks of a sulphuric-acid plant; it is also in close proximity to the nitric-acid plant. Though corrugated-galvanized sheets 24-gauge last only four to six years in this plant, this zinc roof, after twenty-five years' continuous exposure to fumes of carbonic, sulphurous, sulphuric, and nitric acids, is to-day in perfect condition.

4. Zinc is more brittle in cold weather, and when in this condition is hard to "work," and easily damaged. In very cold weather it becomes impossible to drive zinc nails and rivets unless they are first warmed and are kept warm until used. Aluminum rivets may be used in any weather, but require preliminary punching. Many workmen or contractors will refuse to do this, and in cold weather will use galvanized steel nails which, of course, should never be used on a zinc job as, sooner or later, some will rust out. Below 40 degrees Fahrenheit zinc suffers from rough handling. At 25 degrees Fahrenheit even corrugated-zinc sheets are liable to be seriously damaged in construction. Zinc cornice work and construction with zinc sheets should be done only in weather ranging from mild to hot.

5. The tensile strength of zinc is low, about half that of iron; this entails the use of heavier gauges, deeper corrugations, and closer spacing of supports for zinc sheets. In this respect zinc sheets are at a slight disadvantage. With corrugated-steel sheets a maximum purlin spacing of 6 feet is allowable, while with zinc sheets 4 feet is the desirable maximum, and that only for the heavier gauges, 14-gauge under normal conditions and 15-gauge under heavy snow load. For 12-gauge the spacing should be 45 inches, and for 11-gauge 40 inches. Corrugations for roofing sheets are seven-eighths of an inch deep as against five-eighths of an inch in steel sheets. It is desirable to lay sheets to cover two spans (three purlins), bringing into play the effect of continuous beam action.

6. Zinc has a greater ratio of expansion than iron. Most of the failures of zinc roofs are traceable to failure to provide for proper expansion and construction corresponding to the range in temperature. Yet there is no mystery and no special difficulty about laying a zinc roof; it is simply a question of understanding the reason for the specifications laid down and following them.

Only Eleven Sizes of Steel Reinforcing Bars After January 1, 1925

AS a result of a conference held at the Department of Commerce in Washington on September 9, 1924, the following recommendation was made, relative to the manufacture, distribution, and use of steel reinforcing bars—round and square:

"In accordance with the unanimous action of the joint conference of representatives of manufacturers, distributors, and users of square and round steel reinforcing bars, the United States Department of Commerce, through the Bureau of Standards, recommends that the recognized sizes of square and round steel reinforcing bars, in terms of cross-sectional area, be reduced to the following:

SIZE IN INCHES	AREA IN SQUARE INCHES	SIZE IN INCHES	AREA IN SQUARE INCHES
¼ Round	.049	⅞ Round	.601
⅜ Round	.110	1 Round	.785
½ Round	.196	1 Square	1.000
½ Square	.250	1⅛ Square	1.266
⅝ Round	.307	1¼ Square	1.563
¾ Round	.442		

"It is further recommended that this reduced list of sizes become effective as applying to new production January 1, 1925, and that every effort be made to clear current orders and existing stocks of the eliminated areas before March 1, 1925."

This recommendation has received practically the unanimous acceptance by manufacturers, distributors, and users throughout the entire United States.

At a recent meeting of the Concrete Reinforcing Steel Institute, made up of members of the Reinforcing Bar Interests of the United States, these recommendations were accepted.

Another step forward to more simplified and economical building has been attained.

All industries have agreed hereafter to produce, distribute, or use only the eleven sizes of steel reinforcing bars mentioned in the above recommendation.

This was accomplished through the untiring efforts of the Division of Simplified Practice of the Department of Commerce at Washington.

A Terra-Cotta Institute

A THREE days' Terra-Cotta Institute will be held at the Carnegie Institute of Pittsburgh in Pittsburgh in co-operation with the National Terra Cotta Society on March 17, 18, and 19, according to an announcement. The meeting, which is announced as the first of its kind arranged in this country, is being planned for the benefit of architects and the building, terra-cotta, and ceramic industries.

With the exception of a registration fee of one dollar, no tuition fees or other charges will be made to those who attend the institute.

Among the lecturers already engaged for the sessions are: F. S. Laurence, executive secretary, of the National Terra Cotta Society, on "Terra-Cotta in Architectural Design;" Adolph Hottinger, treasurer, The Northwestern Terra Cotta Company, Chicago, on a technical subject in ceramic science; Cecil Fidler, of the Atlantic Terra Cotta Company, Perth Amboy, N. J., upon requirements of construction in terra-cotta; A. H. Sheffield, Terra Cotta Service Bureau, Chicago, upon a general subject of terra-cotta.

All of the meetings of the institute will be held in the College of Fine Arts.

Strikes Almost Nil in San Francisco

American Plan Brings Labor Peace

LABOR strikes are costly to the whole community—not merely to the particular industry involved. The U. S. Bureau of Labor Statistics reports 8,081 strikes in the United States for the eight years 1916–1924, with an estimated loss in dollars and cents to the workers, employers, and the public of over $12,500,000,000. This is equal to two-thirds of all the savings deposits in United States banks, and is more than one-half of the whole public debt of the United States, including war issues.

In 1923 there were over 700 strikes in the United States, with a total loss of $703,000,000. Forty-six of these were in California, but only five in San Francisco. These latter were of short duration and all resulted in the establishment of the American plan. In the year 1921, the closed shop prevailed in San Francisco during the first eight months; and the total number of strikes for the year was twenty-two, with a loss to the public of $22,500,000. Then came the American plan, and in 1922 the strikes in San Francisco had been reduced to eleven, with a total loss of $5,375,000. In 1923 there were five strikes in San Francisco, involving a total loss of $2,490,000. In 1924 to date there were four strikes—all small—involving a total loss of only $68,000.

Gold Medal to Be Given to Sir Edwin Landseer Lutyens

THE gold medal of the American Institute of Architects, which is the highest award of the institute, will be given this spring to Sir Edwin Landseer Lutyens, the distinguished British architect.

Sir Edwin is the architect of many notable buildings in England and was recently commissioned to design the British Government Buildings at Delhi, India. He is now on his way to India.

The fifty-eighth annual convention of the institute will be held in New York during the time of the forthcoming architectural exposition and it is expected that the presentation of the medal will be made to the British architect at that time.

A number of notable achievements of Sir Edwin's are described and illustrated in Laurence Weaver's book, "Houses and Gardens by Sir Edwin Lutyens," published in this country by the Scribners.

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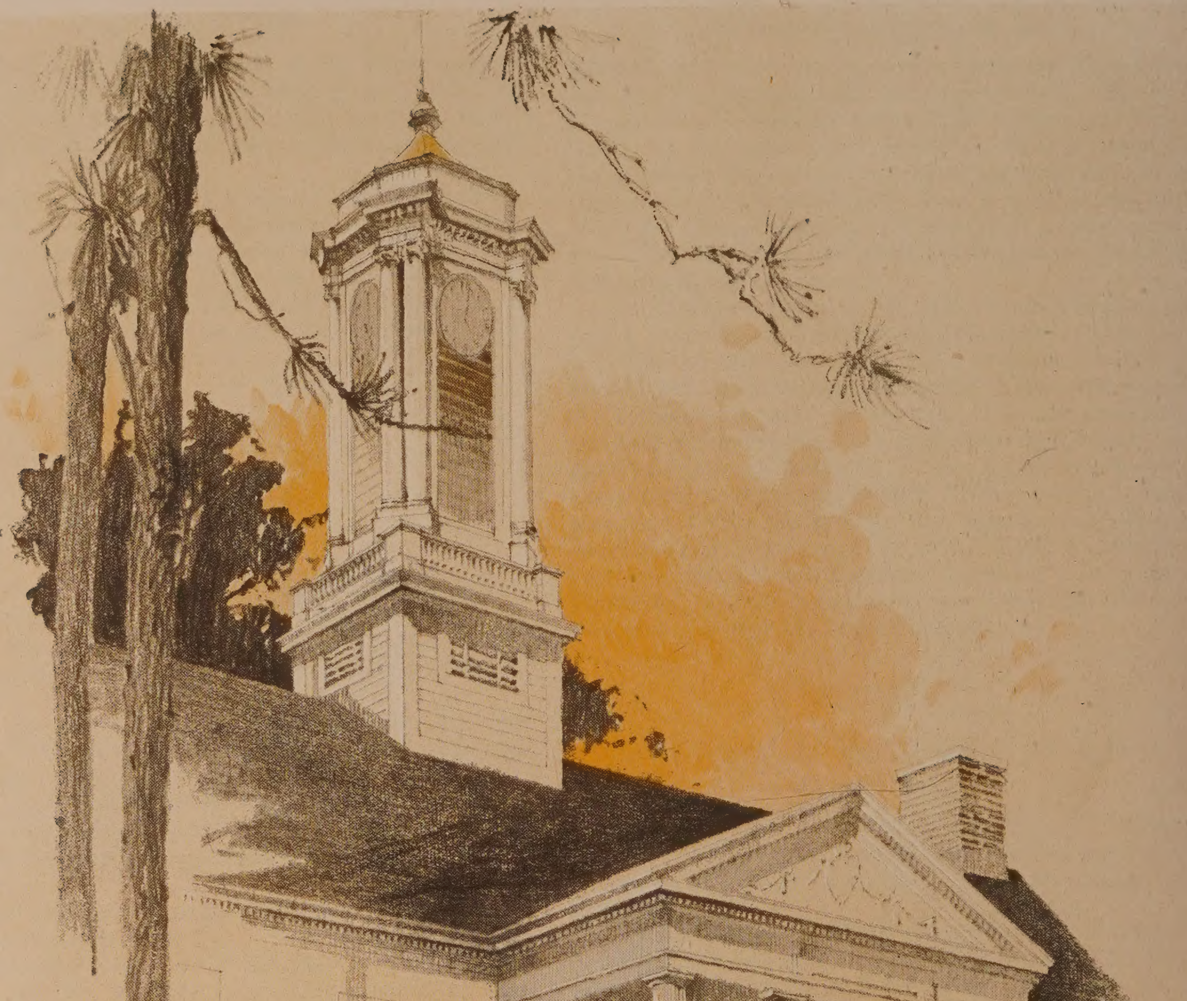

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